PB80-212921

Field Tests of Industrial Stoker Coal-Fired Boilers for Emissions Control and Efficiency Improvement - Site E (Data Supplement)

KVB, Inc.
Minneapolis, MN

Prepared for

Industrial Environmental Research Lab.
Research Triangle Park, NC

Apr 80

U.S. Department of Commerce
National Technical Information Service
NTIS.

TECHNICAL REPORT DATA
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1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/7-80-064b		PB 80 212921

4. TITLE AND SUBTITLE	5. REPORT DATE
Field Tests of Industrial Stoker Coal-fired Boilers for Emissions Control and Efficiency Improvement--Site E (Data Supplement)	April 1980
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) J. O. Burlingame, R. A. Parker, W. M. Jackson, and J. D. Demont	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS KVB, Inc. 6176 Olson Memorial Highway Minneapolis, Minnesota 55422	10. PROGRAM ELEMENT NO. EHE624
	11. CONTRACT/GRANT NO. EPA-IAG-D7-E681 and DOE-EF-77-C-01-2609
12. SPONSORING AGENCY NAME AND ADDRESS EPA, Office of Research and Development * Industrial Environmental Research Laboratory Research Triangle Park, NC 27711	13. TYPE OF REPORT AND PERIOD COVERED Supplement; 11/78-1/79
	14. SPONSORING AGENCY CODE EPA/600/13

15. SUPPLEMENTARY NOTES (*)Cosponsors are DOE and American Boiler Manufacturers Assoc. Project officers are R. Hall (EPA) and W. Harvey Jr. (DOE). The final technical report is EPA-600/7-80-064a.

16. ABSTRACT The Data Supplement is a compilation of test data presented in greater detail than was practical in the final technical report. It is intended to provide the necessary details to other researchers who are interested in performing their own analysis. Readers are referred to the contract final report for information as to objectives, description of facility tested and coals fired, test equipment and procedures, interpretations, and conclusions. The final technical report also contains data summaries not found in this supplement. The Supplement contains panel board data for each test, detailed particulate, O2, CO2, NO, SO2, and SO3 data, particle size distribution data, modified smoke spot data, chemical analysis of the coal, and coal size consistency data.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group	
Air Pollution	Improvement	Air Pollution Control	13B	
Boilers	Efficiency	Stationary Sources	13A	
Combustion	Flue Gases	Combustion Modification	21B	
Coal	Fly Ash	Spreader Stokers	21D	
Field Tests	Particle Size	Particulate	14B	
Dust	Nitrogen Oxides	Overfire Air	11G	07B
Stokers	Sulfur Oxides	Flyash Reinjection		

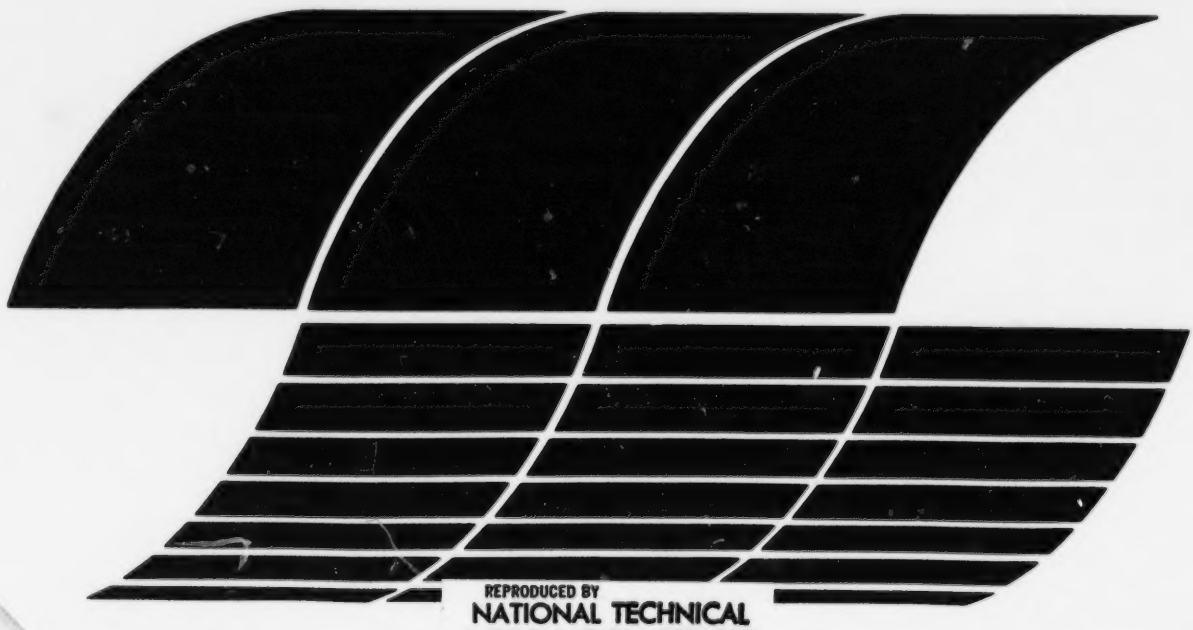
18. DISTRIBUTION STATEMENT	19. SECURITY CLASS (This Report)	21. NO. OF PAGES
Release to Public	Unclassified	
	20. SECURITY CLASS (This page) Unclassified	22. PRICE

EPA Form 2220-1 (9-73)

ABMA	American Boiler Manufacturers Association	1500 Wilson Boulevard Arlington VA 22209	PB80-212921
DoE	United States Department of Energy	Division of Power Systems Energy Technology Branch Washington DC 20545	
EPA	U.S. Environmental Protection Agency Office of Research and Development	Industrial Environmental Research Laboratory Research Triangle Park NC 27711	EPA-600/7-80-064b April 1980

Field Tests of Industrial Stoker Coal-fired Boilers for Emissions Control and Efficiency Improvement — Site E (Data Supplement)

Interagency Energy/Environment R&D Program Report



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EPA-600/7-80-064b

April 1980

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by

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Program Element No. EHE624

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Industrial Environmental Research Laboratory
Office of Environmental Engineering and Technology
Research Triangle Park, NC 27711

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Research and Development
Washington, DC 20460

U.S. DEPARTMENT OF ENERGY
Division of Power Systems/Energy Technology Branch
Washington, DC 20545

and

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The Data Supplement is a compilation of test data presented in greater detail than was practical in the Final Technical Report. It is intended to provide the necessary details to other researchers who are interested in performing their own analysis. Readers are referred to the contract final report for information as to objectives, description of facility tested and coals fired, test equipment and procedures, interpretations and conclusions. The Final Technical Report also contains data summaries not found in this volume. The Supplement contains panel board data for each test, detailed particulate, O_2, CO_2, NO, SO_2 and SO_3 data, particle size distribution data, modified smoke spot data, chemical analysis of the coal and coal size consistency data.

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FOREWORD

The purpose of this Data Supplement Volume is to document data in greater detail than was practical in the Final Technical Report.[1] It is intended to provide the necessary details to other researchers who are interested in performing their own analysis. Readers are referred to the contract final report for information as to objectives, description of facility tested and coals fired, test equipment and procedures, interpretations and conclusions. The Final Technical Report also contains data summaries not found in this volume.

The data in this volume are arranged by type (i.e., Panel Board Data, Particulate Data, etc.) and within each type by test number. Data summaries where they exist are at the front of each section. The boiler tested is referred to as Boiler E; as it is the fifth boiler tested under the program entitled, "A Testing Program to Update Equipment Specifications and Design Criteria for Stoker Fired Boilers."

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[1]Gabrielson, J. E., et al, "Field Tests of Industrial Stoker Coal-Fired Boilers for Emissions Control and Efficiency Improvement - Site E."

CONVERSION FACTORS

ENGLISH AND METRIC UNITS TO SI UNITS

To Convert From	To	Multiply By
in	cm	2.540
in^2	cm^2	6.452
ft	m	0.3048
ft^2	m^2	0.09290
ft^3	m^3	0.02832
lb	Kg	0.4536
lb/hr	Mg/s	0.1260
$lb/10^6$BTU	ng/J	430
g/Mcal	ng/J	239
BTU	J	1054
BTU/lb	J/kg	2324
BTU/hr	W	0.2929
J/sec	W	1.000
J/hr	W	3600
BTU/ft/hr	W/m	0.9609
BTU/ft/hr	J/hr/m	3459
$BTU/ft^2/hr$	W/m^2	3.152
$BTU/ft^2/hr$	$J/hr/m^2$	11349
$BTU/ft^3/hr$	W/m^3	10.34
$BTU/ft^3/hr$	$J/hr/m^3$	37234
psia	Pa	6895
$"H_2O$	Pa	249.1
Rankine	Celsius	C = 5/9R-273
Fahrenheit	Celsius	C = 5/9(F-32)
Celsius	Kelvin	K = C+273
Rankine	Kelvin	K = 5/9R

FOR TYPICAL COAL FUEL

ppm @ 3% O_2 (SO_2)	ng/J	($lb/10^6$Btu)	0.851 ($1.98x10^{-3}$)
ppm @ 3% O_2 (SO_3)	ng/J	($lb/10^6$Btu)	1.063 ($2.47x10^{-3}$)
ppm @ 3% O_2 (NO)*	ng/J	($lb/10^6$Btu)	0.399 ($9.28x10^{-4}$)
ppm @ 3% O_2 (NO_2)	ng/J	($lb/10^6$Btu)	0.611 ($1.42x10^{-3}$)
ppm @ 3% O_2 (CO)	ng/J	($lb/10^6$Btu)	0.372 ($8.65x10^{-4}$)
ppm @ 3% O_2 (CH_4)	ng/J	($lb/10^6$Btu)	0.213 ($4.95x10^{-4}$)

*Federal environmental regulations express NOx in terms of NO_2; thus NO units should be converted using the NO_2 conversion factor.

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CONVERSION FACTORS

SI UNITS TO ENGLISH AND METRIC UNITS

To Convert From	To	Multiply By
cm	in	0.3937
cm^2	in^2	0.1550
m	ft	3.281
m^2	ft^2	10.764
m^3	ft^3	35.315
Kg	lb	2.205
Mg/s	lb/hr	7.937
ng/J	$lb/10^6$BTU	0.00233
ng/J	g/Mcal	0.00418
J	BTU	0.000948
J/kg	BTU/lb	0.000430
J/hr/m	BTU/ft/hr	0.000289
$J/hr/m^2$	$BTU/ft^2/hr$	0.0000881
$J/hr/m^3$	$BTU/ft^3/hr$	0.0000269
W	BTU/hr	3.414
W	J/hr	0.000278
W/m	BTU/ft/hr	1.041
W/m^2	$BTU/ft^2/hr$	0.317
W/m^3	$BTU/ft^3/hr$	0.0967
Pa	psia	0.000145
Pa	$"H_2O$	0.004014
Kelvin	Fahrenheit	F = 1.8K-460
Celsius	Fahrenheit	F = 1.8C+32
Fahrenheit	Rankine	R = F+460
Kelvin	Rankine	R = 1.8K

FOR TYPICAL COAL FUEL

ng/J	ppm @ 3% O_2 (SO_2)	1.18
ng/J	ppm @ 3% O_2 (SO_3)	0.941
ng/J	ppm @ 3% O_2 (NO)	2.51
ng/J	ppm @ 3% O_2 (NO_2)	1.64
ng/J	ppm @ 3% O_2 (CO)	2.69
ng/J	ppm @ 3% O_2 (CH_4)	4.69

SI PREFIXES

Multiplication Factor	Prefix	SI Symbol
10^{18}	exa	E
10^{15}	peta	P
10^{12}	tera	T
10^{9}	giga	G
10^{6}	mega	M
10^{3}	kilo	k
10^{2}	hecto*	h
10^{1}	deka*	da
10^{-1}	deci*	d
10^{-2}	centi*	c
10^{-3}	milli	m
10^{-6}	micro	μ
10^{-9}	nano	n
10^{-12}	pico	p
10^{-15}	femto	f
10^{-18}	atto	a

*Not recommended but occasionally used

EMISSION UNITS CONVERSION FACTORS
FOR TYPICAL COAL FUEL (HV = 13,320 BTU/LB)

To Obtain \ Multiply By	% Weight in Fuel S	% Weight in Fuel N	lbs/10^6Btu SO_2	lbs/10^6Btu NO_2	grams/10^6Cal SO_2	grams/10^6Cal NO_2	PPM (Dry @ 3% O_2) SOx	PPM (Dry @ 3% O_2) NOx	Grains/SCF. (Dry @ 12% CO_2) SO_2	Grains/SCF. (Dry @ 12% CO_2) NO_2
% Weight In Fuel S	1		0.666		0.370		13.2×10^{-4}		1.48	
% Weight In Fuel N				0.405		0.225		5.76×10^{-4}		.903
lbs/10^6Btu SO_2	1.50		1		(.556)		19.8×10^{-4}		(2.23)	
lbs/10^6Btu NO_2		2.47				(.556)		14.2×10^{-4}		(2.23)
grams/10^6Cal SO_2	2.70		(1.8)		1		35.6×10^{-4}		(4.01)	
grams/10^6Cal NO_2		4.44		(1.8)				25.6×10^{-4}		(4.01)
PPM (Dry @ 3% O_2) SOx	758		505		281		1		1127	
PPM (Dry @ 3% O_2) NOx		1736		704		391				1566
Grains/SCF (Dry @ 12% CO_2) SO_2	.676		(.448)		(.249)		8.87×10^{-4}		1	
Grains/SCF (Dry @ 12% CO_2) NO_2		1.11		(.448)		(.249)		6.39×10^{-4}		

NOTE: 1. Values in parenthesis can be used for all flue gas constituents such as oxides of carbon, oxides of nitrogen, oxides of sulfur, hydrocarbons, particulates, etc.
2. Standard reference temperature of 530°R was used.

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SECTION 1.0

PANEL BOARD DATA

1.1 CONTROL ROOM DATA SHEETS PAGE 2

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr_____
Load, %_____
Coal, lb/hr_____

TEST NO.	1				
DESCRIPTION	Max load with part furn				
COAL	Kent Coal	Industrial	Mine		
DATE	11/8				
STEAM INTEGRATOR x 200 lbs.	750167				
TIME	14:28				
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	1.0				
RELATIVE AIR FLOW (green)	164				
STEAM TEMPERATURE, °F (blue)	432				
STEAM INDICATOR X 1000 lb/hr	107				
DRUM LEVEL (red)	-.2				
OXYGEN, % (green)	4.9				
SMOKE x 0.5 RINGLEMAN (blue)	3 3				
DRUM INDICATOR X 1 inch	-.2				
ECON GAS IN, °F (red)	560				
ECON GAS OUT, °F (green)	340				
ECON WATER IN, °F (blue)	217				
ECON WATER OUT, °F (purple)	215				

KVB

TEST NO.	1				
STEAM HEADER PRESS, psig	170				
DRUM PRESSURE (black), psig	194				
FEEDWATER PRESS (red), psig	268				
DRAFT GAUGES					
WINDBOX, "H_2O	0.6				
FURNACE, "H_2O	-.26				
BOILER OUTLET, "H_2O	-.8				
ECONOMIZER OUTLET, "H_2O	-3.5				
COLLECTOR OUTLET, "H_2O	-5.2				
OVERFIRE AIR FRONT, "H_2O	28				
OVERFIRE AIR REAR, "H_2O	23				
CONTROLS					
FUEL FEED	37				
STEAM FLOW/AIR FLOW (AUX)	50 +				
F.D. DAMPER	—				
STEAM FLOW/AIR FLOW	76				
OVERFIRE AIR	45				
FURNACE DRAFT	45				
ID FAN AMPS	105				
FD FAN AMPS	—				

KVB

TEST NO.	1				
GRATE SPEED, REL.	2.8				
GRATE PRESSURE, PSIG	35				
GRATE #1 FEEDER LENGTH, REL.	16				
GRATE #2 FEEDER LENGTH, REL.	22				
GRATE #3 FEEDER LENGTH, REL.	20				
GRATE #4 FEEDER LENGTH, REL.	14				
FRONT OVERFIRE AIR (upper/lower) "H_2O					
REAR OVERFIRE AIR (upper/lower) "H_2O					
REINJECTION AIR, "H_2O					
ASH BED THICKNESS, inches	2-3"				
COAL SCALE #1 x 200 lbs	271344				
COAL SCALE #2 x 200 lbs	367796				
TIME OF READING	1455				

KVB

NOTES

Reproduced from best available copy.

TEST NO: 1 Flow map for [illegible] with point figures
Flow can not be reached point for is to be open

Steam Injection is the needs to be recalibrated

TEST NO: Test switched because of unrealistic readings (velocity)
at 0% Test out

TEST NO:

TEST NO:

TEST NO:

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 91,222
Load, % 52.7
Coal, lb/hr 9886

TEST NO.	2				
DESCRIPTION	max load with Fuels				
COAL	Kent Coal	Indianfield	Illinois		
DATE	11-16		11-16		
STEAM INTEGRATOR x 200 lbs.	761679	762578	763359		
TIME	14:09	16:01	17:50		
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	0.93	95	0.94	} 94,000	
RELATIVE AIR FLOW (green)	1.64	1.63	1.64		
STEAM TEMPERATURE, °F (blue)	432	430	430		
STEAM INDICATOR X 1000 lb/hr	100	102	102	} 101,000	
DRUM LEVEL (red)	-1.0	-1.2	-1.2		
OXYGEN, % (green)	4.4	5.5	5.5		
SMOKE x 0.5 RINGLEMAN (blue)	2.4	2.3	2.5		
DRUM INDICATOR X 1 inch	-1.0	-1.2	-1.2		
ECON GAS IN, °F (red)	560	560	560		
ECON GAS OUT, °F (green)	335	330	330		
ECON WATER IN, °F (blue)	210	205	205		
ECON WATER OUT, °F (purple)	270	270	270		

KVB

TEST NO.	2				
STEAM HEADER PRESS, psig	190	190	190		
DRUM PRESSURE (black), psig	190	190	195		
FEEDWATER PRESS (red), psig	267	270	265		
DRAFT GAUGES					
WINDBOX, "H_2O	0.6	06	0.6		
FURNACE, "H_2O	-.16	-.13	-.13		
BOILER OUTLET, "H_2O	.70	-.65	-.65		
ECONOMIZER OUTLET, "H_2O	3.3	3.3	3.3		
COLLECTOR OUTLET, "H_2O	5.0	5.0	5.0		
OVERFIRE AIR FRONT, "H_2O	28	28	28		
OVERFIRE AIR REAR, "H_2O	30	30	30		
CONTROLS					
FUEL FEED	47	60	60		
STEAM FLOW/AIR FLOW (AUX)	100+	100+	100+		
F.D. DAMPER	—	—	—		
STEAM FLOW/AIR FLOW	60	60	60		
OVERFIRE AIR	55	62	62		
FURNACE DRAFT	45	45	45		
ID FAN AMPS	60	60	60		
FD FAN AMPS	—	—	—		

KVB

TEST NO.	2				
GRATE SPEED, REL.	08	10			
GRATE PRESSURE, PSIG	30	30			
GRATE #1 FEEDER LENGTH, REL.	22	22			
GRATE #2 FEEDER LENGTH, REL.	24	24			
GRATE #3 FEEDER LENGTH, REL.	20	20			
GRATE #4 FEEDER LENGTH, REL.	20	20			
FRONT OVERFIRE AIR (upper/lower) psi	1 1/4 / 1 1/4				
REAR OVERFIRE AIR (upper/lower) psi	1" / 1"				
REINJECTION AIR, psi	1 1/8				
ASH BED THICKNESS, inches	3"				
Primary Forced Fan % Oz	1075	1144			
Primary Forced Fan Temp	98°F				
COAL SCALE #1 x 200 lbs	272029	273103			
COAL SCALE #2 x 200 lbs	268497	268578			
TIME OF READING	2:39	2:42			

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 69,064
Load, % 84
Coal, lb/hr 7520

TEST NO.	3	3	5		
DESCRIPTION	low load stabilization				
COAL	Kittanning				
DATE	11-18				
STEAM INTEGRATOR x 200 lbs.	78033	78264	78514		
TIME	12:20	12:00	14:13		
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	74	72	76	} 75,000	
RELATIVE AIR FLOW (green)	130	130	130		
STEAM TEMPERATURE, °F (blue)	430	430	430		
STEAM INDICATOR X 1000 lb/hr	77	82	85	} 81,000	
DRUM LEVEL (red)	-10	-04	-06		
OXYGEN, % (green)	6.4	6.5	6.7		
SMOKE x 0.5 RINGLEMAN (blue)	3-4	3 3.7	3.35		
DRUM INDICATOR X 1 inch	-1.0	-05	-.06		
ECON GAS IN, °F (red)	510	505	516		
ECON GAS OUT, °F (green)	310	307	307		
ECON WATER IN, °F (blue)	207	207	207		
ECON WATER OUT, °F (purple)	268	264	262		

KVB

TEST NO.	3	3	3		
STEAM HEADER PRESS, psig	187	188	186		
DRUM PRESSURE (black), psig	185	188	186		
FEEDWATER PRESS (red), psig	295	294	292		
DRAFT GAUGES					
WINDBOX, "H_2O	-.2	-.2	-.2		
FURNACE, "H_2O	-.11	-.11	-.11		
BOILER OUTLET, "H_2O	-.38	-.40	-.40		
ECONOMIZER OUTLET, "H_2O	-.20	-.20	-.20		
COLLECTOR OUTLET, "H_2O	-3.0	-3.0	-2.9		
OVERFIRE AIR FRONT, "H_2O	28.5	28.5	28.5		
OVERFIRE AIR REAR, "H_2O	28.5	26.0	25.5		
CONTROLS					
FUEL FEED	35	37	33		
STEAM FLOW/AIR FLOW (AUX)	—	—	—		
F.D. DAMPER	40	40	40		
STEAM FLOW/AIR FLOW	52	50	53		
OVERFIRE AIR	58	60	60		
FURNACE DRAFT	30	30	30		
ID FAN AMPS	085	085	085		
FD FAN AMPS	15	15	15		

Sheet 3 of 4

KVB

TEST NO.	3	3	3		
GRATE SPEED, REL.	20	20	20		
GRATE PRESSURE, PSIG	35	40	40		
GRATE #1 FEEDER LENGTH, REL.	22	23	23		
GRATE #2 FEEDER LENGTH, REL.	28	30	30		
GRATE #3 FEEDER LENGTH, REL.	28	28	28		
GRATE #4 FEEDER LENGTH, REL.	23	25	25		
FRONT OVERFIRE AIR (upper/lower) "H_2O	—/1½ psi	—/1½			
REAR OVERFIRE AIR (upper/lower) "H_2O	7/16 PSI/15 KPSI	7/16/1½	/		
REINJECTION AIR, "H_2O	1 3/16 psi	1 3/16			
ASH BED THICKNESS, inches	3"	3"	3"		
COAL SCALE #1 x 200 lbs	369811		369842		
COAL SCALE #2 x 200 lbs	273231		273281		
TIME OF READING	12:25		14:10		

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 109300
Load, % 60.7
Coal, lb/hr 13803

TEST NO.	3	4	4	4	
DESCRIPTION	max load w.t. gas flows				
COAL	Kentucky				
DATE	11-20-78				
STEAM INTEGRATOR x 200 lbs.	806250	807004	807781	809436	
TIME	12:18	13:37	15:03	16:18	
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	118	117	105	} 110,00	
RELATIVE AIR FLOW (green)	1.65	1.65	1.65		
STEAM TEMPERATURE, °F (blue)	432	432	430		
STEAM INDICATOR X 1000 lb/hr	123	125	115	} 121,000	
DRUM LEVEL (red)	-2.0	+0.8	0		
OXYGEN, % (green)	4.7	4.3	4.8		
SMOKE x 0.5 RINGLEMAN (blue)	3.0	2.3 2.7	2.8		
DRUM INDICATOR X 1 inch	-.2 0	+.8	0		
ECON GAS IN, °F (red)	612	607	602		
ECON GAS OUT, °F (green)	365	360	360		
ECON WATER IN, °F (blue)	217	218	218		
ECON WATER OUT, °F (purple)	277	277	277		

KVB

TEST NO.	4	4	4		
STEAM HEADER PRESS, psig	192	191	190		
DRUM PRESSURE (black), psig	200	202	200		
FEEDWATER PRESS (red), psig	245	240	240		
DRAFT GAUGES					
WINDBOX, "H_2O	0.8	0.9	0.9		
FURNACE, "H_2O	0.17	0.15	0.13		
BOILER OUTLET, "H_2O	0.95	0.90	0.90		
ECONOMIZER OUTLET, "H_2O	4.7	4.5	4.7		
COLLECTOR OUTLET, "H_2O	7.1	7.0	7.2		
OVERFIRE AIR FRONT, "H_2O	28.0	28.0	28.0		
OVERFIRE AIR REAR, "H_2O	29.0	30+	30+		
CONTROLS					
FUEL FEED	33	43	65		
STEAM FLOW/AIR FLOW (AUX) Scale +100	64	65	65		
F.D. DAMPER	–	–	–		
STEAM FLOW/AIR FLOW	68	72	72		
OVERFIRE AIR	65	75	64		
FURNACE DRAFT	60	60	60		
ID FAN AMPS	30	005	005		
FD FAN AMPS	–	–	–		

KVB

TEST NO.	4	4	4		
GRATE SPEED, REL.	20	2.0	2.0		
GRATE PRESSURE, PSIG	40	40	40		
GRATE #1 FEEDER LENGTH, REL.	22	22	22		
GRATE #2 FEEDER LENGTH, REL.	28	27	27		
GRATE #3 FEEDER LENGTH, REL.	30	30	30		
GRATE #4 FEEDER LENGTH, REL.	25	25	25		
FRONT OVERFIRE AIR (upper/lower) "H_2O	1⅛ PSI / 1 3/16 PSI				
REAR OVERFIRE AIR (upper/lower) "H_2O	⅛ PSI / 1⅛ PSI				
REINJECTION AIR, "H_2O	1⅛ PSI				
ASH BED THICKNESS, inches	3-4"				
COAL SCALE #1 x 200 lbs	274606		274713		
COAL SCALE #2 x 200 lbs	371536		371677		
TIME OF READING	12 25		16.18		

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 92,332
Load, % 513
Coal, lb/hr 11,617

TEST NO.	5	5	5		
DESCRIPTION	low load with part furnace				
COAL	Kentucky	Fireline Mine			
DATE	11-2-75				
STEAM INTEGRATOR x 200 lbs.	820153	820806	821637		
TIME	12 58	14.25	16.11		
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	90	95	100		
RELATIVE AIR FLOW (green)	1.66	166	1.61		
STEAM TEMPERATURE, °F (blue)	430	430	432		
STEAM INDICATOR X 1000 lb/hr	100	105	107		
DRUM LEVEL (red)	-1.2	-0 6	+.2		
OXYGEN, % (green)	85	84	6.5		
SMOKE x 0.5 RINGLEMAN (blue)	35	35	down 2.0		
DRUM INDICATOR X 1 inch	-1.2	-0.6	+.2		
ECON GAS IN, °F (red)	560	560	560		
ECON GAS OUT, °F (green)	360	355	355		
ECON WATER IN, °F (blue)	226	226	227		
ECON WATER OUT, °F (purple)	298	296	294		

Sheet 2 of 4

KVB

TEST NO.	5	5.	5		
STEAM HEADER PRESS, psig	184	184	190		
DRUM PRESSURE (black), psig	190	192	195		
FEEDWATER PRESS (red), psig	266	263	262		
DRAFT GAUGES					
WINDBOX, "H_2O	0.9	1.9	0.9		
FURNACE, "H_2O	- 0.15	- 0.09	- 0.10		
BOILER OUTLET, "H_2O	- 0.90	- 0.80	- 0.90		
ECONOMIZER OUTLET, "H_2O	-4.5	-4.2	- 4.2		
COLLECTOR OUTLET, "H_2O	-7.0	-6.4	-6.3		
OVERFIRE AIR FRONT, "H_2O	28.0	28.0	28.0		
OVERFIRE AIR REAR, "H_2O	30+	30.0	30+		
CONTROLS					
FUEL FEED	60	40	45		
STEAM FLOW/AIR FLOW (AUX)	100+	85	95		
F.D. DAMPER	—	—	—		
STEAM FLOW/AIR FLOW	64	62	62		
OVERFIRE AIR	85	65	80		
FURNACE DRAFT	60	55	65		
ID FAN AMPS	105	105	105		
FD FAN AMPS	—	—	—		

Sheet 3 of 4

KVB

TEST NO.	5	5			
GRATE SPEED, REL.	26	26	32		
GRATE PRESSURE, PSIG	40	40	40		
GRATE #1 FEEDER LENGTH, REL.	30	27	30		
GRATE #2 FEEDER LENGTH, REL.	35	32	35		
GRATE #3 FEEDER LENGTH, REL.	35	32	35		
GRATE #4 FEEDER LENGTH, REL.	32	28	32		
FRONT OVERFIRE AIR (upper/lower) "H_2O	1"/1"				
REAR OVERFIRE AIR (upper/lower) "H_2O	3/4"/1"				
REINJECTION AIR, "H_2O	1 3/4"				
ASH BED THICKNESS, inches	3"	3"			
COAL SCALE #1 x 200 lbs	27534		421		
COAL SCALE #2 x 200 lbs	31257		673		
TIME OF READING	13.04		16:12		

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 97,453
Load, % 54.1
Coal, lb/hr 12,584

TEST NO.	6				
DESCRIPTION	~~Dust Firing~~ low O.F.A				
COAL	Industrial	Mine (Run Coal)			
DATE	12-12-78				
STEAM INTEGRATOR x 200 lbs.	978132	978970	977764		
TIME	14.00	15.40	17.21		
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	1.06	1.00	1.02		
RELATIVE AIR FLOW (green)	1.24	1.25	1.25		
STEAM TEMPERATURE, °F (blue)	432	431	431		
STEAM INDICATOR X 1000 lb/hr	110	101	107		
DRUM LEVEL (red)	-1.5	-0.5	-0.5		
OXYGEN, % (green)	4.0	4.2	4.5		
SMOKE x 0.5 RINGLEMAN (blue)	2.3	3.0 / 1.7 (Tube cleaned)	2.5		
DRUM INDICATOR X 1 inch	+2.0	+1.5	+1.5		
ECON GAS IN, °F (red)	580	580	580		
ECON GAS OUT, °F (green)	354	355	355		
ECON WATER IN, °F (blue)	210	205	206		
ECON WATER OUT, °F (purple)	260	270	270		

KVB

TEST NO.	6				
STEAM HEADER PRESS, psig	142	140	140		
DRUM PRESSURE (black), psig	198	196	198		
FEEDWATER PRESS (red), psig	294	295	279		
DRAFT GAUGES					
WINDBOX, "H_2O	+0.6	+08	+08		
FURNACE, "H_2O	-0.31	-.050	-.10		
BOILER OUTLET, "H_2O	-0.90	-0.85	-.80		
ECONOMIZER OUTLET, "H_2O	-3.7	-3.6	-3.7		
COLLECTOR OUTLET, "H_2O	-6.0	-5.6	-6.0		
OVERFIRE AIR FRONT, "H_2O	28.0	28.0	28.0		
OVERFIRE AIR REAR, "H_2O	18.5	22.0	22.0		
CONTROLS					
FUEL FEED	70	70	70		
STEAM FLOW/AIR FLOW (AUX)	85	85	85		
F.D. DAMPER	—	—	—		
STEAM FLOW/AIR FLOW	60	60	60		
OVERFIRE AIR	50	60	60		
FURNACE DRAFT	50	50	50		
ID FAN AMPS	005	005	005		
FD FAN AMPS	—	—	—		

KVB

TEST NO.	6				
GRATE SPEED, REL.	2.5		2.5		
GRATE PRESSURE, PSIG	40		40		
GRATE #1 FEEDER LENGTH, REL.	23		23		
GRATE #2 FEEDER LENGTH, REL.	30		35		
GRATE #3 FEEDER LENGTH, REL.	30		30		
GRATE #4 FEEDER LENGTH, REL.	23		30		
FRONT OVERFIRE AIR (upper/lower) "H_2O	1¼/1⅛				
REAR OVERFIRE AIR (upper/lower) "H_2O	⅛ psi/¼ psi				
REINJECTION AIR, "H_2O	1⅛ psi				
ASH BED THICKNESS, inches	3"-4"	3-4"	3-4"		
	ash bed is				
	clinkering				
COAL SCALE #1 x 200 lbs	286643		6001	= 104	
COAL SCALE #2 x 200 lbs	387234		7320	= 86	
TIME OF READING	14:25		17:30		

KVB

NOTES

TEST NO: 6 - Boiler ran for about an hour with door O.F.A. at 185 "H2O
due to smoke O.F.A was raised to 20"
at 15:35 raised to 22"

TEST NO:

TEST NO:

TEST NO:

TEST NO:

KVB

ABMA TEST SITE E
BOILER NO, 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 101,205
Load, % 56.2
Coal, lb/hr 13,385

TEST NO.	7	7	7		
DESCRIPTION	Vary OFA Point Furnace	high oxygen rear OFA			
COAL	Kent Industrial				
DATE	12-14-78				
STEAM INTEGRATOR x 200 lbs.	980370	978953	978214	977165	
TIME	11:15	14:05	15:36	17:37	
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	.97	1.02	.92		
RELATIVE AIR FLOW (green)	1.25	1.26	1.25		
STEAM TEMPERATURE, °F (blue)	430	430	430		
STEAM INDICATOR X 1000 lb/hr	104	110	101		
DRUM LEVEL (red)	-1.5	-1.0	-1.0		
OXYGEN, % (green)	>10	>10	>10		
SMOKE x 0.5 RINGLEMAN (blue)	4.6	4.4	4.5		
DRUM INDICATOR X 1 inch	+0.8	+1.0	+1.0		
ECON GAS IN, °F (red)	580	579	580		
ECON GAS OUT, °F (green)	360	360	360		
ECON WATER IN, °F (blue)	210	210	211		
ECON WATER OUT, °F (purple)	267	260	266		
	gaseous in truck brake never functioned				

KVB

TEST NO.	7	7	7		
STEAM HEADER PRESS, psig	190	190	189		
DRUM PRESSURE (black), psig	198	201	197		
FEEDWATER PRESS (red), psig	270	280	280		
DRAFT GAUGES					
WINDBOX, "H_2O	08	08	0.9		
FURNACE, "H_2O	-0.15	-0.13	-0.17		
BOILER OUTLET, "H_2O	-0.8	-0.9	-0.7		
ECONOMIZER OUTLET, "H_2O	-3.8	-4.0	-4.0		
COLLECTOR OUTLET, "H_2O	-5.8	-6.0	-6.1		
OVERFIRE AIR FRONT, "H_2O	28.0	28.0	28.0		
OVERFIRE AIR REAR, "H_2O	20.0	20.0	20.0		
CONTROLS					
FUEL FEED	75	60	100		
STEAM FLOW/AIR FLOW (AUX)	100+	100+	100+		
F.D. DAMPER	—	—	—		
STEAM FLOW/AIR FLOW	60	60	60		
OVERFIRE AIR	45	45	50		
FURNACE DRAFT	45	45	50		
ID FAN AMPS	—	—	—		
FD FAN AMPS	—	—	—		

Sheet 3 of 4

KVB

TEST NO.	7	7	7		
GRATE SPEED, REL.		2.1	25		
GRATE PRESSURE, PSIG		40	40		
GRATE #1 FEEDER LENGTH, REL.		18	25		
GRATE #2 FEEDER LENGTH, REL.		25	27		
GRATE #3 FEEDER LENGTH, REL.		29	30		
GRATE #4 FEEDER LENGTH, REL.		20	32		
	pre test				
FRONT OVERFIRE AIR (upper/lower) "H_2O		1 psi / 1/16 psi			
REAR OVERFIRE AIR (upper/lower) "H_2O	1/8 / 1 1/16 psi	1 psi / 1 1/16 psi			
REINJECTION AIR, "H_2O	1 1/8 psi	1 1/8 psi			
ASH BED THICKNESS, inches		3"			
			#4 feeder		
			picked up		
Temp Ran to 91° F	91°				
RH %	32				
COAL SCALE #1 x 200 lbs	281008	287120	= 112		
COAL SCALE #2 x 200 lbs	388614	388737	120		
TIME OF READING	1400	1735			

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 41,249
Load, % 50.7
Coal, lb/hr 11,663

TEST NO.	3	8	8		
DESCRIPTION	High O2 lb Upper and lower	with Point	fuses		
COAL	Kentucky	(Industrial)			
DATE	12-15-78				
STEAM INTEGRATOR x 200 lbs.	979970	980619	981307	981968	
TIME	13.03	14:36	15.00	16:20	
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	0.90	0.95	1.00		
RELATIVE AIR FLOW (green)	1.27	1.27	1.27		
STEAM TEMPERATURE, °F (blue)	432	432	432		
STEAM INDICATOR X 1000 lb/hr	95	100	105		
DRUM LEVEL (red)	-1.5	-1.5	-1.5		
OXYGEN, % (green)	>10	>10	>10		
SMOKE x 0.5 RINGLEMAN (blue)	3.8	3.8	3.5		
DRUM INDICATOR X 1 inch	+0.5	+0.1	+0.1		
ECON GAS IN, °F (red)	550	550	550		
ECON GAS OUT, °F (green)	360	360	360		
ECON WATER IN, °F (blue)	214	215	215		
ECON WATER OUT, °F (purple)	272	281	285		

KVB

TEST NO.	8	4	8		
STEAM HEADER PRESS, psig	189	190	190		
DRUM PRESSURE (black), psig	141	142	140		
FEEDWATER PRESS (red), psig	280	290	280		
DRAFT GAUGES					
WINDBOX, "H_2O	0.6	0.7	07		
FURNACE, "H_2O	-028	-0.15	-0,19		
BOILER OUTLET, "H_2O	-10	-0.8	-0.8		
ECONOMIZER OUTLET, "H_2O	-40	-37	-37		
COLLECTOR OUTLET, "H_2O	-6.4	-5.8	-5.6		
OVERFIRE AIR FRONT, "H_2O	25.0	25.0	25.5		
OVERFIRE AIR REAR, "H_2O	28.0	28.0	28.0		
CONTROLS					
FUEL FEED	75	75	70		
STEAM FLOW/AIR FLOW (AUX)	100+	100+	100+		
F.D. DAMPER	—	—	—		
STEAM FLOW/AIR FLOW	55	55	55		
OVERFIRE AIR	80	80	80		
FURNACE DRAFT	55	50	50		
ID FAN AMPS	—	—	—		
FD FAN AMPS	—	—	—		

KVB

TEST NO.	8	8	6		
GRATE SPEED, REL.	2.2	2.2	2.2		
GRATE PRESSURE, PSIG	40	40	40		
GRATE #1 FEEDER LENGTH, REL.	16	22	22		
GRATE #2 FEEDER LENGTH, REL.	26	25	26		
GRATE #3 FEEDER LENGTH, REL.	26	26	26		
GRATE #4 FEEDER LENGTH, REL.	20	27	27		
FRONT OVERFIRE AIR (upper/lower) "H_2O	1PSI/1PSI				
REAR OVERFIRE AIR (upper/lower) "H_2O	1PSI / 5/16PSI				
REINJECTION AIR, "H_2O	1PSI				
ASH BED THICKNESS, inches	2.5'				
Point Fan temp °F	91°				
RH	35%				
COAL SCALE #1 x 200 lbs	384405		384502	= 97	
COAL SCALE #2 x 200 lbs	247447		247671	= 76	
TIME OF READING	1323		1631		

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 85,015
Load, % 47.2
Coal, lb/hr 10375

TEST NO.	9	9	9		
DESCRIPTION	Without point power				
COAL	Kentucky Coal - Industrial Mine				
DATE	12-16-76				
STEAM INTEGRATOR x 200 lbs.	991066	991757	992327	993490	
TIME	13:05	2:43	16:03	18:26	
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	.85	.86	.90		
RELATIVE AIR FLOW (green)	1.18	1.2	1.20		
STEAM TEMPERATURE, °F (blue)	430	430	430		
STEAM INDICATOR X 1000 lb/hr	90	90	98		
DRUM LEVEL (red)	-.05	-1.2	-1.3		
OXYGEN, % (green)	>10	>10	>10		
SMOKE x 0.5 RINGLEMAN (blue)	3.2	6.4	3.4		
DRUM INDICATOR X 1 inch	+1.5	+.9	+0.8		
ECON GAS IN, °F (red)	540	545	545		
ECON GAS OUT, °F (green)	320	325	325		
ECON WATER IN, °F (blue)	178	180	180		
ECON WATER OUT, °F (purple)	242	240	240		

KVB

TEST NO.	9	9	9		
STEAM HEADER PRESS, psig	188	189	189		
DRUM PRESSURE (black), psig	190	190	189		
FEEDWATER PRESS (red), psig	275	275	277		
DRAFT GAUGES					
WINDBOX, "H_2O	07	0.6	0.6		
FURNACE, "H_2O	-0.10	-0.06	-0.10		
BOILER OUTLET, "H_2O	-0.6	-0.6	-0.6		
ECONOMIZER OUTLET, "H_2O	-3.0	-3.0	-3.1		
COLLECTOR OUTLET, "H_2O	-4.6	-4.8	-4.8		
OVERFIRE AIR FRONT, "H_2O	28.0	28	28		
OVERFIRE AIR REAR, "H_2O	24	24	24		
CONTROLS					
FUEL FEED	60	65	65		
STEAM FLOW/AIR FLOW (AUX)	-	-	-		
F.D. DAMPER	55	55	55		
STEAM FLOW/AIR FLOW	50	52	50		
OVERFIRE AIR	55	58	55		
FURNACE DRAFT	40	40	40		
ID FAN AMPS	-	-	-		
FD FAN AMPS	15	15	15		

KVB

TEST NO.	9				
GRATE SPEED, REL.	26	2.6	26		
GRATE PRESSURE, PSIG	40	40	40		
GRATE #1 FEEDER LENGTH, REL.	18	20	20		
GRATE #2 FEEDER LENGTH, REL.	23	24	24		
GRATE #3 FEEDER LENGTH, REL.	26	27	27		
GRATE #4 FEEDER LENGTH, REL.	20	20	20		
FRONT OVERFIRE AIR (upper/lower) "H_2O	1psi / 1 psi				
REAR OVERFIRE AIR (upper/lower) "H_2O	½ psi / 13/16 psi				
REINJECTION AIR, "H_2O	1⅛ psi				
ASH BED THICKNESS, inches	3"		3"		
COAL SCALE #1 x 200 lbs	340147		390244	-91	
COAL SCALE #2 x 200 lbs	288222		288299	-77	
TIME OF READING	13.15		16.27		

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr [illegible]
Load, % [illegible]
Coal, lb/hr 11620

TEST NO.	[illegible]	[illegible]	[illegible]		
DESCRIPTION	[illegible]	[illegible]		[illegible]	[illegible]
				[illegible]	[illegible]
COAL	[illegible]				
DATE	12-17-75				
STEAM INTEGRATOR x 200 lbs.	[illegible]	[illegible]			[illegible]
TIME	[illegible]	[illegible]		[illegible]	[illegible]
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	[illegible]	[illegible]		[illegible]	
RELATIVE AIR FLOW (green)	[illegible]	[illegible]		[illegible]	
STEAM TEMPERATURE, °F (blue)	[illegible]	[illegible]		[illegible]	
STEAM INDICATOR X 1000 lb/hr	[illegible]	[illegible]		[illegible]	
DRUM LEVEL (red)	-2		[illegible]	[illegible]	
OXYGEN, % (green)	[illegible]		[illegible]	[illegible]	
SMOKE x 0.5 RINGLEMAN (blue)	[illegible]		[illegible]	[illegible]	
DRUM INDICATOR X 1 inch	[illegible]		[illegible]	[illegible]	
ECON GAS IN, °F (red)	[illegible]		[illegible]	[illegible]	
ECON GAS OUT, °F (green)	[illegible]		[illegible]	[illegible]	
ECON WATER IN, °F (blue)	[illegible]	[illegible]		[illegible]	
ECON WATER OUT, °F (purple)	[illegible]	[illegible]		[illegible]	

KVB

TEST NO.	10				
STEAM HEADER PRESS, psig	190	190			
DRUM PRESSURE (black), psig	200	195			
FEEDWATER PRESS (red), psig	270	265			
DRAFT GAUGES					
WINDBOX, "H_2O	1	0.8	0.8	0.8	
FURNACE, "H_2O	-.15	-0.04	-.15	-.15	
BOILER OUTLET, "H_2O	-.8	-.8	-.8	-.85	
ECONOMIZER OUTLET, "H_2O	-4.1	-4.0	-4.2	-4.3	
COLLECTOR OUTLET, "H_2O	-6.1	-6	-6.2	-6.4	
OVERFIRE AIR FRONT, "H_2O	28	28	28	27	
OVERFIRE AIR REAR, "H_2O	26	26	>30	13	
CONTROLS					
FUEL FEED	60	60	60	60	
STEAM FLOW/AIR FLOW (AUX)	6	6	6	6	
F.D. DAMPER	62	30	30	30	
STEAM FLOW/AIR FLOW	58	58	58	59	
OVERFIRE AIR	60	60	72	40	
FURNACE DRAFT	19	14	13	20	
ID FAN AMPS	—				
FD FAN AMPS	16.5	16.5	16.5	16.5	

KVB

TEST NO.					
GRATE SPEED, REL.					
GRATE PRESSURE, PSIG					
GRATE #1 FEEDER LENGTH, REL.					
GRATE #2 FEEDER LENGTH, REL.					
GRATE #3 FEEDER LENGTH, REL.					
GRATE #4 FEEDER LENGTH, REL.					
FRONT OVERFIRE AIR (upper/lower) "H_2O					
REAR OVERFIRE AIR (upper/lower) "H_2O					
REINJECTION AIR, "H_2O					
ASH BED THICKNESS, inches					
COAL SCALE #1 x 200 lbs					
COAL SCALE #2 x 200 lbs					
TIME OF READING					

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 93,447 lbs/hr
Load, % 51.9 %
Coal, lb/hr 12,218 lbs/hr

TEST NO.	11	11	11		
DESCRIPTION	low OFA				
COAL	KENTUCKY -	INDUSTRIAL			
DATE	12-18-78				
STEAM INTEGRATOR x 200 lbs.	012942	013584	014321	014773	
TIME	13:35	14:58	16:32	17:30	
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	0.98	0.96	0.94		
RELATIVE AIR FLOW (green)	1.25	1.25	1.25		
STEAM TEMPERATURE, °F (blue)	430	430	431		
STEAM INDICATOR X 1000 lb/hr	103	103	100		
DRUM LEVEL (red)	-1.5	-1.7	-2.0		
OXYGEN, % (green)	>10	>10	>10		
SMOKE x 0.5 RINGLEMAN (blue)	4.7	4.6	4.5		
DRUM INDICATOR X 1 inch	+0.6	+0.4	0		
ECON GAS IN, °F (red)	550	555	565		
ECON GAS OUT, °F (green)	355	354	360		
ECON WATER IN, °F (blue)	214	215	216		
ECON WATER OUT, °F (purple)	270	272	266		

KVB

TEST NO.	11	11	11		
STEAM HEADER PRESS, psig	190	190	190		
DRUM PRESSURE (black), psig	192	145	145		
FEEDWATER PRESS (red), psig	270	260	262		
DRAFT GAUGES					
WINDBOX, "H_2O	0.8	0.9	1.0		
FURNACE, "H_2O	-.23	-.20	-.15		
BOILER OUTLET, "H_2O	-.85	-.80	-0.80		
ECONOMIZER OUTLET, "H_2O	-3.8	-3.7	-3.7		
COLLECTOR OUTLET, "H_2O	-5.8	-5.7	-5.7		
OVERFIRE AIR FRONT, "H_2O	28.0	28.0	28.5		
OVERFIRE AIR REAR, "H_2O	5.0	5.0	5.0		
CONTROLS					
FUEL FEED	87	80	95		
STEAM FLOW/AIR FLOW (AUX)	100+	100+	100+		
F.D. DAMPER	—	—	—		
STEAM FLOW/AIR FLOW	58	58	56		
OVERFIRE AIR	30	30	30		
FURNACE DRAFT	50	50	50		
ID FAN AMPS	—	—	—		
FD FAN AMPS	—	—	—		

KVB

TEST NO.	11	11	11		
GRATE SPEED, REL.	2.5	2.5	2.5		
GRATE PRESSURE, PSIG	40	40	40		
GRATE #1 FEEDER LENGTH, REL.	25	25	23		
GRATE #2 FEEDER LENGTH, REL.	27	27	29		
GRATE #3 FEEDER LENGTH, REL.	27	27	30		
GRATE #4 FEEDER LENGTH, REL.	23	23	25		
FRONT OVERFIRE AIR (upper/lower) "H_2O	1 psi / 1 psi				
REAR OVERFIRE AIR (upper/lower) "H_2O	½ psi / ½ psi				
REINJECTION AIR, "H_2O	1 ½ psi				
ASH BED THICKNESS, inches	3"	3"	3"		
COAL SCALE #1 x 200 lbs	572		673	101	
COAL SCALE #2 x 200 lbs	743		874	131	
TIME OF READING	13 42		17.30		

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 98,031
Load, % 54.5
Coal, lb/hr 12,963

TEST NO.	12				
DESCRIPTION	med load ~~point~~ forces				
COAL	Crushed				
DATE	12-20-78				
STEAM INTEGRATOR x 200 lbs.	033406	034034	034514	034999	
TIME	9:30	10:15	10:45	12:45	
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	100	1.05	102		
RELATIVE AIR FLOW (green)	1.26	1.26	1.26		
STEAM TEMPERATURE, °F (blue)	430	430	430		
STEAM INDICATOR X 1000 lb/hr	107	112	110		
DRUM LEVEL (red)	-1.5	-2.0	-1.8		
OXYGEN, % (green)	>10	>10	>10		
SMOKE x 0.5 RINGLEMAN (blue)	5.8/3.0	3.3	3.5		
DRUM INDICATOR X 1 inch	+.6	+.2	+.4		
ECON GAS IN, °F (red)	565	582	582		
ECON GAS OUT, °F (green)	352	355	356		
ECON WATER IN, °F (blue)	212	212	212		
ECON WATER OUT, °F (purple)	264	265	265		

Sheet 2 of 4

KVB

TEST NO.	12	12	12		
STEAM HEADER PRESS, psig	190	190	190		
DRUM PRESSURE (black), psig	195	200	199		
FEEDWATER PRESS (red), psig	270	267	268		
DRAFT GAUGES					
WINDBOX, "H_2O	0.9	0.9	0.8		
FURNACE, "H_2O	-0.10	-0.08	-0.15		
BOILER OUTLET, "H_2O	-0.7	-0.7	-0.8		
ECONOMIZER OUTLET, "H_2O	-3.8	-3.8	-4.0		
COLLECTOR OUTLET, "H_2O	-6.0	-6.0	-6.4		
OVERFIRE AIR FRONT, "H_2O	27.0	27.0	27.0		
OVERFIRE AIR REAR, "H_2O	25.0	25.0	25.0		
CONTROLS					
FUEL FEED	80	77	70		
STEAM FLOW/AIR FLOW (AUX)	100+	100+	100+		
F.D. DAMPER	—	—	—		
STEAM FLOW/AIR FLOW	60	60	60		
OVERFIRE AIR	60	60	60		
FURNACE DRAFT	50	50	50		
ID FAN AMPS	—		—		
FD FAN AMPS	—		—		

Sheet 3 of 4

KVB

TEST NO.	12	12			
GRATE SPEED, REL.	36	36	30		
GRATE PRESSURE, PSIG	40	40	40		
GRATE #1 FEEDER LENGTH, REL.	33	33	30		
GRATE #2 FEEDER LENGTH, REL.	32	32	27		
GRATE #3 FEEDER LENGTH, REL.	32	33	27		
GRATE #4 FEEDER LENGTH, REL.	30	30	26		
FRONT OVERFIRE AIR (upper/lower) "H_2O	1psi / 1psi				
REAR OVERFIRE AIR (upper/lower) "H_2O	1/8psi / 13/16psi				
REINJECTION AIR, "H_2O	1psi				
ASH BED THICKNESS, inches	3"				
Plant Air Temp	91°F				
RH	36%				
COAL SCALE #1 x 200 lbs	364	343	= 169		
COAL SCALE #2 x 200 lbs	168	861	= 93		
TIME OF READING	9.36	12:43			

KVB

NOTES

TEST NO: Boiler #1 614522 at 9:35 } 97,143
616052 at 12:41 }

9.29 16 s Tons / 16 coal on Boiler #1

coal scale- 341 462 } 10,460
524 616 }

at 9:36 12:43

TEST NO:

TEST NO:

TEST NO:

TEST NO:

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 72,000
Load, % 40.0%
Coal, lb/hr 9413

TEST NO.	13	13	13		
DESCRIPTION	low load with point flame				
COAL	crushed				
DATE	12-20-28				
STEAM INTEGRATOR x 200 lbs.	035684	036130	037424	36733	
TIME	14:21	15:32	16:23	17:15	
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	0.77	0.72	0.10		
RELATIVE AIR FLOW (green)	1.27	1.25	1.25		
STEAM TEMPERATURE, °F (blue)	430	430	430		
STEAM INDICATOR X 1000 lb/hr	85	81	80		
DRUM LEVEL (red)	-1.8	-1.8	-1.8		
OXYGEN, % (green)	>10	>10	>10		
SMOKE x 0.5 RINGLEMAN (blue)	4.5	5.5	5.5		
DRUM INDICATOR X 1 inch	+.4	+.4	+.4		
ECON GAS IN, °F (red)	560	545	535		
ECON GAS OUT, °F (green)	350	350	348		
ECON WATER IN, °F (blue)	212	212	212		
ECON WATER OUT, °F (purple)	272	275	278		

KVB

TEST NO.	13	13	13		
STEAM HEADER PRESS, psig	189	187	189		
DRUM PRESSURE (black), psig	190	186	190		
FEEDWATER PRESS (red), psig	265	266	278		
DRAFT GAUGES					
WINDBOX, "H_2O	0.8	0.9	1.8		
FURNACE, "H_2O	-.15	-.13	-.15		
BOILER OUTLET, "H_2O	-0.85	-0.75	-0.75		
ECONOMIZER OUTLET, "H_2O	-4.0	-3.6	-3.6		
COLLECTOR OUTLET, "H_2O	-6.2	-5.6	-5.5		
OVERFIRE AIR FRONT, "H_2O	27.0	27.0	27.0		
OVERFIRE AIR REAR, "H_2O	25.0	25.0	25.0		
CONTROLS					
FUEL FEED	45	45	50		
STEAM FLOW/AIR FLOW (AUX)	95	95	95		
F.D. DAMPER	-	-	-		
STEAM FLOW/AIR FLOW	50	48	45		
OVERFIRE AIR	60	60	60		
FURNACE DRAFT	55	50	50		
ID FAN AMPS	-	-	-		
FD FAN AMPS	-	-	-		

Sheet 3 of 4

KVB

TEST NO.	13	13	13		
GRATE SPEED, REL.	2.0	2.0	2.0		
GRATE PRESSURE, PSIG	40	40	40		
GRATE #1 FEEDER LENGTH, REL.	26	26	26		
GRATE #2 FEEDER LENGTH, REL.	24	25	25		
GRATE #3 FEEDER LENGTH, REL.	25	26	26		
GRATE #4 FEEDER LENGTH, REL.	23	24	24		
FRONT OVERFIRE AIR (upper/lower) "H_2O	4"/1PSI				
REAR OVERFIRE AIR (upper/lower) "H_2O	1.5PSI/1.5/1.5PSI				
REINJECTION AIR, "H_2O	1PSI				
ASH BED THICKNESS, inches	3"				
COAL SCALE #1 x 200 lbs	448		515	= 67	
COAL SCALE #2 x 200 lbs	907		971	= 64	
TIME OF READING	2:27		17:14		

KVB

NOTES

TEST NO: Boiler #1 COAL SERIES

2:27 496 - 684 18:15 567 - 746 - 9143 lbs/hr

steam (143) 616890 61 8950 5:15 106,182 lbs/hr

forgot to write down this

TEST NO: 13 - Water level had held steady all day until 16:00 when it went from -1.8 to -5.0 kep to +2.0 it took about 15 to 20 minutes to level off

TEST NO:

TEST NO:

TEST NO:

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 103,858
Load, % 57.1
Coal, lb/hr 14,165

TEST NO.	14				
DESCRIPTION	high load point 4 fuses				
COAL	Crushed				
DATE	12-20-78				
STEAM INTEGRATOR x 200 lbs.	38044	38785	39328	39749	
TIME	809	928	1031	1126	
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	1.12	1.10	1.10		
RELATIVE AIR FLOW (green)	1.27	1.29	1.28		
STEAM TEMPERATURE, °F (blue)	431	430	430		
STEAM INDICATOR X 1000 lb/hr	120	120	120		
DRUM LEVEL (red)	-2.2	-2.5	-2.6		
OXYGEN, % (green)	8.8	8.3	8.8		
SMOKE x 0.5 RINGLEMAN (blue)	5.2	5.7	7		
DRUM INDICATOR X 1 inch	-.2	-.4	-.5		
ECON GAS IN, °F (red)	580	590	600		
ECON GAS OUT, °F (green)	357	360	363		
ECON WATER IN, °F (blue)	216	215	215		
ECON WATER OUT, °F (purple)	264	267	267		

KVB

TEST NO.	14	14	14		
STEAM HEADER PRESS, psig	190	191	192		
DRUM PRESSURE (black), psig	201	200	203		
FEEDWATER PRESS (red), psig	257	270	254		
DRAFT GAUGES					
WINDBOX, "H_2O	09	0.7	046		
FURNACE, "H_2O	-.109	-.15	-.15		
BOILER OUTLET, "H_2O	-.80	-.80	-.85		
ECONOMIZER OUTLET, "H_2O	-3.8	-3.9	-4.2		
COLLECTOR OUTLET, "H_2O	-58	-60	-64		
OVERFIRE AIR FRONT, "H_2O	27.0	27.0	27		
OVERFIRE AIR REAR, "H_2O	25.0	25.0	25		
CONTROLS					
FUEL FEED	87	87	100		
STEAM FLOW/AIR FLOW (AUX)	100+	100+	100+		
F.D. DAMPER	-	-	-		
STEAM FLOW/AIR FLOW	65	60	65		
OVERFIRE AIR	60	60	60		
FURNACE DRAFT	50	55	55		
ID FAN AMPS	-	-	-		
FD FAN AMPS	-	-	-		

Sheet 3 of 4

KVB

TEST NO.	14				
GRATE SPEED, REL.	3.5	35	35		
GRATE PRESSURE, PSIG	40	40	40		
GRATE #1 FEEDER LENGTH, REL.	33	33	37		
GRATE #2 FEEDER LENGTH, REL.	30	31	32		
GRATE #3 FEEDER LENGTH, REL.	28	24	30		
GRATE #4 FEEDER LENGTH, REL.	30	31	31		
FRONT OVERFIRE AIR (upper/lower) "H_2O	1psi / 1psi				
REAR OVERFIRE AIR (upper/lower) "H_2O	1/8 / 1/16 psi				
REINJECTION AIR, "H_2O	1½ psi				
ASH BED THICKNESS, inches	3"				
Paint fan temp	93°F				
RH	34%				
COAL SCALE #1 x 200 lbs	64	724	= 113		
COAL SCALE #2 x 200 lbs	62	178	= 116		
TIME OF READING	8:10	11:24			

KVB

NOTES

Boiler #1 steam

TEST NO: 8:10 - 614182 6:0709 11.26 75,122 lbs/hr

~~8:18~~ 813 877 11:24 80695 lbs/hr

621 642

9.32 lb/lb

TEST NO:

TEST NO:

TEST NO:

TEST NO:

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 104,848
Load, % 58.2%
Coal, lb/hr 14,043 25T

TEST NO.	15	15	15		
DESCRIPTION	normal O2				
COAL	EASTERN KENT. 2% coal				
DATE	1-5-78				
STEAM INTEGRATOR x 200 lbs.	141890	142682	143524	143620	
TIME	9:42	11:12	12:25	13:01	
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	1.15	1.03	1.09		
RELATIVE AIR FLOW (green)	1.27	1.27	1.27		
STEAM TEMPERATURE, °F (blue)	430	430	430		
STEAM INDICATOR X 1000 lb/hr	120	110	114		
DRUM LEVEL (red)	-.26	.26	-.28		
OXYGEN, % (green)	>10	>10	>10		
SMOKE x 0.5 RINGLEMAN (blue)	3.3	3.8	4.2		
DRUM INDICATOR X 1 inch	-.6	-.4	-.6		
ECON GAS IN, °F (red)	600	602	605		
ECON GAS OUT, °F (green)	370	371	373		
ECON WATER IN, °F (blue)	220	224	220		
ECON WATER OUT, °F (purple)	263	270	273		

KVB

TEST NO.	15				
STEAM HEADER PRESS, psig	188	190	194		
DRUM PRESSURE (black), psig	198	201	205		
FEEDWATER PRESS (red), psig	273	273	278		
DRAFT GAUGES					
WINDBOX, "H_2O	10	09	10		
FURNACE, "H_2O	-010	-012	-017		
BOILER OUTLET, "H_2O	-95	-95	-10		
ECONOMIZER OUTLET, "H_2O	-47	-47	-44		
COLLECTOR OUTLET, "H_2O	-76	-72	-76		
OVERFIRE AIR FRONT, "H_2O	28	25	25		
OVERFIRE AIR REAR, "H_2O	26	26	26		
CONTROLS					
FUEL FEED	80	57	80		
STEAM FLOW/AIR FLOW (AUX)	100+	100+	100+		
F.D. DAMPER	—	—	—		
STEAM FLOW/AIR FLOW	64	62	63		
OVERFIRE AIR	60	60	60		
FURNACE DRAFT	60	60	60		
ID FAN AMPS	—	—	—		
FD FAN AMPS	—	—	—		

Sheet 3 of 4

KVB

TEST NO.	15	15			
GRATE SPEED, REL.	29	32			
GRATE PRESSURE, PSIG	40	40			
GRATE #1 FEEDER LENGTH, REL.	26	29	28		
GRATE #2 FEEDER LENGTH, REL.	28	32	31		
GRATE #3 FEEDER LENGTH, REL.	24	25	25		
GRATE #4 FEEDER LENGTH, REL.	21	24	23		
FRONT OVERFIRE AIR (upper/lower) "H_2O	1 ps. / 1 ps.				
REAR OVERFIRE AIR (upper/lower) "H_2O	1/8 ps. / 1 3/4 ps.				
REINJECTION AIR, "H_2O	1 1/2 ps.				
ASH BED THICKNESS, inches	Left to right 5' - 5"	3' - 5"	3' - 5'		
	ok Clinkers		#3 door - clinkers		
TEMP (AMBIENT AIR FAN) °F	90°F				
Relative humidity %	32%				
COAL SCALE #1 x 200 lbs	249?17	coal scales is being bypassed	115 est		
COAL SCALE #2 x 200 lbs	364451	400086	- 135		
TIME OF READING	9.55	13:02			

KVB

NOTES

TEST NO: 15 - coal seam to be oil enriched
fuel oil spread on coal and burning fuel oil smell by control panel

TEST NO:

TEST NO:

TEST NO:

TEST NO:

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 93,494
Load, % 51%
Coal, lb/hr 14,054

TEST NO.	16	16	16	16	
DESCRIPTION	SASS and	SOx			
COAL	Eastern Kent				
DATE	1-8-74				
STEAM INTEGRATOR x 200 lbs.	169400	170419	171347	172049	
TIME	12.14	14:26	16:21	17:54	
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	1.00	1.00	0.90	0.90	
RELATIVE AIR FLOW (green)	1.27	1.27	1.27		
STEAM TEMPERATURE, °F (blue)	430	430	430		
STEAM INDICATOR X 1000 lb/hr	106	108	91		
DRUM LEVEL (red)	-3.0	-2.5	-4.0		
OXYGEN, % (green)	7.2	6.8	8.0		
SMOKE x 0.5 RINGLEMAN (blue)	29	32	33		
DRUM INDICATOR X 1 inch	-0.8	-1.0	-1.6		
ECON GAS IN, °F (red)	587	592	590		
ECON GAS OUT, °F (green)	361	363	365		
ECON WATER IN, °F (blue)	220	223	225		
ECON WATER OUT, °F (purple)	265	270	274		

KVB

TEST NO.	16	16	16		
STEAM HEADER PRESS, psig	190	190	190		
DRUM PRESSURE (black), psig	197	199	196		
FEEDWATER PRESS (red), psig	278	284	280		
DRAFT GAUGES					
WINDBOX, "H_2O	0.9	0.8	0.8		
FURNACE, "H_2O	-.20	-.22	-.18		
BOILER OUTLET, "H_2O	-.90	-0.9	-.085		
ECONOMIZER OUTLET, "H_2O	-4.1	-4.1	-4.1		
COLLECTOR OUTLET, "H_2O	-6.4	-6.2	-6.4		
OVERFIRE AIR FRONT, "H_2O	27	27	27		
OVERFIRE AIR REAR, "H_2O	22	22	22		
CONTROLS					
FUEL FEED	62	60	90		
STEAM FLOW/AIR FLOW (AUX)	70	70	70		
F.D. DAMPER	—	—	-		
STEAM FLOW/AIR FLOW	60	60	55		
OVERFIRE AIR	55	55	55		
FURNACE DRAFT	50	57	59		
ID FAN AMPS	—	—	-		
FD FAN AMPS	—	—	-		

KVB

TEST NO.	16	16	16		
GRATE SPEED, REL.	3.3	3.3	3.3		
GRATE PRESSURE, PSIG	40	40	40		
GRATE #1 FEEDER LENGTH, REL.	27	26	23		
GRATE #2 FEEDER LENGTH, REL.	20	21	23		
GRATE #3 FEEDER LENGTH, REL.	25	25	29		
GRATE #4 FEEDER LENGTH, REL.	20	20	25		
FRONT OVERFIRE AIR (upper/lower) "H_2O	28"/29"				
REAR OVERFIRE AIR (upper/lower) "H_2O	10"/20"				
REINJECTION AIR, "H_2O	30"				
ASH BED THICKNESS, inches	3" even				
COAL SCALE #1 x 200 lbs	241327	194 passed	190		
COAL SCALE #2 x 200 lbs	402046	402346	= 200		
TIME OF READING	12.21	12:54			

KVB

NOTES

TEST NO: 16 Load down to 90 KM/hr due to shift back at 16.00 to 17.00
TEST NO:
TEST NO:
TEST NO:
TEST NO:

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 92,667
Load, % 57.5
Coal, lb/hr 16,207

TEST NO.	17				
DESCRIPTION	SASS				
COAL	Kmt				
DATE	1-10-79				
STEAM INTEGRATOR x 200 lbs.	190345	191145	192135	192430	
TIME	10.25	12:11	14:09	14:55	
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	0.98	0.92	0.94		
RELATIVE AIR FLOW (green)	1.27	1.27	1.27		
STEAM TEMPERATURE, °F (blue)	430	430	430		
STEAM INDICATOR X 1000 lb/hr	105	99	101		
DRUM LEVEL (red)	-2.4	-2.8	-3.6		
OXYGEN, % (green)	6.4	8.2	6.7		
SMOKE x 0.5 RINGLEMAN (blue)	4.5	5.0	5.0		
DRUM INDICATOR X 1 inch	-.2	-.6	-1.4		
ECON GAS IN, °F (red)	600	590	592		
ECON GAS OUT, °F (green)	360	360	357		
ECON WATER IN, °F (blue)	221	224	223		
ECON WATER OUT, °F (purple)	266	274	276		

KVB

TEST NO.	17	17	17		
STEAM HEADER PRESS, psig	192	192	192		
DRUM PRESSURE (black), psig	203	200	201		
FEEDWATER PRESS (red), psig	284	285	285		
DRAFT GAUGES					
WINDBOX, "H_2O	0.9	0.9	0.9		
FURNACE, "H_2O	-.27	-0.30	-0.29		
BOILER OUTLET, "H_2O	-1.0	-1.1	-1.1		
ECONOMIZER OUTLET, "H_2O	-4.5	-4.5	-4.4		
COLLECTOR OUTLET, "H_2O	-6.4	-6.8	-6.8		
OVERFIRE AIR FRONT, "H_2O	28.0	28.0	28.0		
OVERFIRE AIR REAR, "H_2O	230	225	230		
CONTROLS					
FUEL FEED	60	60	61		
STEAM FLOW/AIR FLOW (AUX)	80	83	83		
F.D. DAMPER	-	-	-		
STEAM FLOW/AIR FLOW	58	55	55		
OVERFIRE AIR	57	57	55		
FURNACE DRAFT	58	57	55		
ID FAN AMPS	-	-	-		
FD FAN AMPS	-	-	-		

KVB

TEST NO.	17	17	17		
GRATE SPEED, REL.	20	20	20		
GRATE PRESSURE, PSIG	40	40	40		
GRATE #1 FEEDER LENGTH, REL.	22	22	23		
GRATE #2 FEEDER LENGTH, REL.	23	23	24		
GRATE #3 FEEDER LENGTH, REL.	26	26	21		
GRATE #4 FEEDER LENGTH, REL.	24	24	26		
FRONT OVERFIRE AIR (upper/lower) "H_2O	28"/28"				
REAR OVERFIRE AIR (upper/lower) "H_2O	9"/23"				
REINJECTION AIR, "H_2O	30"				
ASH BED THICKNESS, inches	3"		3"		
COAL SCALE #1 x 200 lbs	29 727	does not dump		180 est	
COAL SCALE #2 x 200 lbs	409716		403702	186	
TIME OF READING	10 29		1500		

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 97,808
Load, % 54.3
Coal, lb/hr [redacted] est

TEST NO.	18			12203	
DESCRIPTION	Very Dr				
COAL	Kent				
DATE	1-12-79				
STEAM INTEGRATOR x 200 lbs.	212155			212750	
TIME	942			1055	
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	100	1.01	.98	100	
RELATIVE AIR [illegible] (green)	1.27		1.28	1.28	
STEAM TEMPERATURE, °F (blue)	430				
STEAM INDICATOR X 1000 lb/hr	106	107	103	107	
DRUM LEVEL (red)	-2.6	-2.6	-2.6	-3.0	
OXYGEN, % (green)	5.3	4.8	6.0	4.3	
SMOKE x 0.5 RINGLEMAN (blue)	3.2			3.5	
DRUM INDICATOR X 1 inch	-.6	-.6	-.6	-1.0	
ECON GAS IN, °F (red)	587				
ECON GAS OUT, °F (green)	357				
ECON WATER IN, °F (blue)	221				
ECON WATER OUT, °F (purple)	267				

KVB

TEST NO.	18				
STEAM HEADER PRESS, psig	192				
DRUM PRESSURE (black), psig	201				
FEEDWATER PRESS (red), psig	284				
DRAFT GAUGES					
WINDBOX, "H_2O	08	08	08	08	
FURNACE, "H_2O	-.27	-.28	-.24	-.24	
BOILER OUTLET, "H_2O	-08	-09	-09	-09	
ECONOMIZER OUTLET, "H_2O	-4.0	-4.2	-4.2	-4.2	
COLLECTOR OUTLET, "H_2O	-5.9	-6.1	-6.4	-6.4	
OVERFIRE AIR FRONT, "H_2O	27.0			27.0	
OVERFIRE AIR REAR, "H_2O	24.5			24.5	
CONTROLS					
FUEL FEED	60			65	
STEAM FLOW/AIR FLOW (AUX)	90	85	100	80	
F.D. DAMPER	-			-	
STEAM FLOW/AIR FLOW	58				
OVERFIRE AIR	60				
FURNACE DRAFT	50				
ID FAN AMPS	-				
FD FAN AMPS	-				

KVB

TEST NO.	14				
GRATE SPEED, REL.	7.6				
GRATE PRESSURE, PSIG	40				
GRATE #1 FEEDER LENGTH, REL.	18				
GRATE #2 FEEDER LENGTH, REL.	24				
GRATE #3 FEEDER LENGTH, REL.	26				
GRATE #4 FEEDER LENGTH, REL.	18				
FRONT OVERFIRE AIR (upper/lower) "H_2O	28"/28"				
REAR OVERFIRE AIR (upper/lower) "H_2O	20"/25"				
REINJECTION AIR, "H_2O	30"				
ASH BED THICKNESS, inches	31"				
COAL SCALE #1 x 200 lbs	727	out of coke			
COAL SCALE #2 x 200 lbs	529	out of coke			
TIME OF READING	9.45	10:58			

KVB

ABMA TEST SITE E
BOILER NO. 2
CONTROL ROOM DATA SHEET

Steam, lb/hr 95072
Load, % 52.8
Coal, lb/hr 13720 est

TEST NO.	20				
DESCRIPTION	max load reg air				
COAL	Kmt				
DATE	1-19-79				
STEAM INTEGRATOR x 200 lbs.	278733	274329	279960	280270	
TIME	2:21	334	4.56	5:35	
CHART RECORDERS					
STEAM FLOW X 100,000 lbs/hr (red)	1.06	1.04	1.05		
RELATIVE AIR FLOW (green)	1.28	1.28	1.28		
STEAM TEMPERATURE, °F (blue)	430	430	430		
STEAM INDICATOR X 1000 lb/hr	-	-	-		
DRUM LEVEL (red)	-4.8	-2.6	-3.2		
OXYGEN, % (green)	>10	>10	>10		
SMOKE x 0.5 RINGLEMAN (blue)	4.0	4.5	4.5		
DRUM INDICATOR X 1 inch	-1.6	+.4	-.3		
ECON GAS IN, °F (red)	585	581	582		
ECON GAS OUT, °F (green)	358	360	366		
ECON WATER IN, °F (blue)	217	217	216		
ECON WATER OUT, °F (purple)	265	276	265		

KVB

TEST NO.	20	20			
STEAM HEADER PRESS, psig	190	189	190		
DRUM PRESSURE (black), psig	197	190	191		
FEEDWATER PRESS (red), psig	283	277	279		
DRAFT GAUGES	—				
WINDBOX, "H_2O	0.8	0.8	0.8		
FURNACE, "H_2O	-.25	-.21	-.22		
BOILER OUTLET, "H_2O	-1.0	-1.0	-1.1		
ECONOMIZER OUTLET, "H_2O	-4.4	-4.8	-4.8		
COLLECTOR OUTLET, "H_2O	-6.2	-6.8	-7.2		
OVERFIRE AIR FRONT, "H_2O	28	28	28		
OVERFIRE AIR REAR, "H_2O	26	26	26		
CONTROLS					
FUEL FEED	75	72	80		
STEAM FLOW/AIR FLOW (AUX)	85	90	80		
F.D. DAMPER	-	-			
STEAM FLOW/AIR FLOW	58	58	58		
OVERFIRE AIR	60	60	60		
FURNACE DRAFT	50	50	50		
ID FAN AMPS	-	-	-		
FD FAN AMPS	-	-	-		

Sheet 3 of 4

KVB

TEST NO.	20	20	20		
GRATE SPEED, REL.	33	33	3.2		
GRATE PRESSURE, PSIG	40	40	40		
GRATE #1 FEEDER LENGTH, REL.	30	30	32		
GRATE #2 FEEDER LENGTH, REL.	28	29	30		
GRATE #3 FEEDER LENGTH, REL.	18	20	22		
GRATE #4 FEEDER LENGTH, REL.	18	22	22		
FRONT OVERFIRE AIR (upper/lower) "H_2O	30"/30"				
REAR OVERFIRE AIR (upper/lower) "H_2O	9"/23"				
REINJECTION AIR, "H_2O	30"				
ASH BED THICKNESS, inches	31" ave				
COAL SCALE #1 x 200 lbs	BYPASSED				
COAL SCALE #2 x 200 lbs					
TIME OF READING					

KVB

NOTES

TEST NO: 20 coal flow is lb/hr estimated due to both scales being by passed Tests 7-17 were both at the same as test 20, so an average of these 2 tests is used 13,720 lbs/hr
TEST NO:
TEST NO:
TEST NO:
TEST NO:

SECTION 2.0

PARTICULATE DATA

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2.2	PARTICULATE DATA SHEETS	72
2.3	PARTICULATE LAB WORKSHEETS	100

PARTICULATE DATA SUMMARY
PART I

BLROUT- 5'7"x17'8"=98.64
ECONOUT-4'2"x17'8"=73.61
Stack- 5'6"x7'=38.50

LOCATION: ABMA TEST SITE E

TEST NO.	Total Mass mgm.	Dry Gas Volume ft^3	Liquid Coll. ml.	Baro. Press. "Hg	Static Press. "H_2O	Pitot ΔP "H_2O	Orifice ΔH "H_2O	Stack Gas Temp. °R	Excess O_2 %	Sampling Time min.	Nozzle Dia. in.	Pitot Factor n.d.	Fuel Factor SCF/10^6BTU	Flue Gas MW g/g mole
5 BLR	79549	52.04	75	29.75	-0.8	0.053	0.44	482	9.9	72	0.505	0.837	9651	29.19
5 MECH	388.0	57.939	81	29.75	+2.6	1.85/.33	0.52	790	9.7	30/75	0.187/0.246	0.837	9651	29.21
6 BLR	3249.9	53.200	87	29.29	-0.8	0.054	1.01	972	7.6	72	0.505	0.837	9564	29.51
6 MECH	4976	33.777/19.376	80	29.29	+1.5	.229/1.615	0.38	788	8.1	85/30	.246/.187	0.837	9564	29.51
7 BLR	10,835.7	59.97	89	29.20	-0.8	0.07	1.3	955	5.2	72	0.505	0.837	9662	29.60
7 MECH	3230.4	19.189/38.531	82	29.20	+2.0	1.56/.272	0.42	786	7.0	30/85	.187/.246	0.837	9662	29.46
8 BLR	7299.9	52.61	78.5	29.00	-08	0.054	1.10	965	6.8	72	0.505	0.837	9641	29.44
8 MECH	289.4	35.935/18.357	71	29.00	+2.2	.223/1.46	0.36	768	7.5	80/30	.246/.187	0.837	9641	29.45
9 BLR	6709.6	53.22	70.5	29.00	-0.8	0.06	0.91	946	7.7	72	0.505	0.837	9670	29.42
9 MECH	857.9	15.827/32.747	59	29.00	-0.32	1.12/.282	.304	766	8.1	30/85	.187/.246	0.837	9670	29.44
10 BLR	Gaseous												—	
10 MECH	Gaseous												—	
11 BLR	7373.7	54.21	71.5	29.00	-0.8	0.056	1.04	962	6.5	72	0.505	0.837	9645	29.59
11 MECH	2658.6	18.832/36.795	82.5	29.00	+1.9	1.48/.34	0.45	770	6.7	30/75	.187/.246	0.837	9645	29.47
12 BLR	6526.1	57.72	87	28.98	-0.8	0.059	1.11	969	5.9	72	0.505	0.837	9652	29.44
12 MECH	3116.5	36.352/18.818	80	28.98	+2.2	.247/1.60	40	775	6.5	85/30	.246/.187	0.837	9652	29.47
13 BLR	5783.9	57.11	70	28.33	-0.8	.057	1.07	946	9.2	72	0.505	0.837	9660	29.39
13 MECH	1945.9	19.246/35.811	75	28.33	+1.9	1.55/.25	0.53	794	9.5	30/85	.187/.246	0.837	9660	29.31
14 BLR	13,395.8	56.83	98	29.38	-0.8	0.073	1.31	986	3.9	72	0.505	0.837	9638	29.49
14 MECH	7561.5	49.580/19.065	102	29.38	+1.8	.29/1.53	0.438	778	5.8	85/30	.246/.187	0.837	✓ 9638	29.47

#15900 rev.

PARTICULATE DATA SUMMARY
PART I

LOCATION: ABMA TEST SITE E

TEST NO.	Total Mass mgm.	Dry Gas Volume ft^3	Liquid Coll. ml.	Baro. Press. "Hg	Static Press. "H_2O	Pitot ΔP "H_2O	Orifice ΔH "H_2O	Stack Gas Temp. °R	Excess O_2 %	Sampling Time min.	Nozzle Dia. in.	Pitot Factor n.d.	Fuel Factor SCF/10^6BTU	Flue Gas MW g/g mole
1S BLR	11350.3	62.51	99	29.83	-0.8	0.077	1.430	1007	5.9	72	0.505	0.837	9.58	29.53
1S STACK	3386.2	57.65 / 20.315 / 37.334	91	29.81	+1.9	1.70 / .224	0.425	775	5.9	30 / 80	0.187 / 0.246	0.837	9.58	29.53
2S BLR	9624.3	64.69	68	29.65	-0.8	0.074	1.466	987	7.0	72	0.505	0.837	9.60	29.66
2S MECH	4317.3	57.688 / 30.275 / 27.413	74	29.65	+1.1	.23 / 1.38	0.377	792	7.0	70 / 50	0.246 / 0.187	0.837	9.60	29.51
2S BLR	2050.4	14.928	27.5	29.67	-0.8	0.035	0.21	953	7.6	60.3	0.381	0.837	9.50	29.47
2S STACK	3762.7	44.342	63	29.67	-0.8	0.06	0.41	779	8.1	96	0.375	0.837	9.50	2940
3 BLR	2709.0	34.14	42.2	29.35	-0.8	0.027	0.49	896	8.8	69	0.505	0837	9.64	2945
3 STACK	388.8	28.85 / 14.143	41.5	29.35	-.2	.133 / .045	0.28	740	9.9	40 / 50	0.187 / 0.246	0.837	9.64	29.37
4 BLR	8631.8	56.27	90	29.86	-0.8	0.062	1.17	996	7.2	72.25	0.505	0.837	9.62	29.42
4 STACK	372.9	23.453 / 33.413	95	29.86	+1.7	.326 / 1.56	0.512	794	7.6	86 / 30	.246 / .187	0.837	9.656	29.45

#15900 rev.

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PARTICULATE DATA SUMMARY
PART II

Location ABMA TEST SITE E - BLR OUT

TEST NO.	LOAD %	O_2 %	CONDITIONS	EMISSIONS lb/10^6BTU	EMISSIONS GR/SCF	EMISSIONS LB/HR	Moisture %	Stack Gas Velocity Ft/sec	Stack Gas Flow SCF/sec	Isokin. %
2				3.464	1.601	625	6.19	13.99	759	96
3				2.960	1.245	438	5.62	11.98	684	89
4				4.972	2.366	1209	7.04	18.97	964	100
5				6.188	2.367	1128	6.41	17.53	926	98
6				2.060	0.961	458	7.32	17.65	927	100
7				5.230	2.848	1556	6.70	19.42	1062	97
8				4.493	2.203	1048	6.78	18.49	969	93
9				3.984	1.824	926	6.07	18.47	987	92
11				4.316	2.160	1048	6.04	17.44	943	98
12				3.509	1.828	901	6.96	18.70	958	102
13				3.631	1.476	723	5.77	18.26	953	99
14				6.469	3.824	2073	7.91	21.00	1054	92
15				5.380	2.801	1581	6.98	21.25	1098	101
20				4.785	2.309	1327	4.77	21.33	1117	99
2 ECON				2.966	1.319	558	6.35	16.58	822	95

02

#15900 Rev.

PARTICULATE DATA SUMMARY
PART II

Location ABMA TEST SITE E - DC OUT (STACK)

TEST NO.	LOAD %	O_2 %	CONDITIONS	EMISSIONS			Moisture %	Stack Gas Velocity Ft/sec	Stack Gas Flow SCF/sec	Isokin. %
				lb/10^6BTU	GR/SCF	LB/HR				
3				0.313	0.120	59	5.02	35.69	965	108 102 106
4				0.198	0.092	71	6.69	58.71	1512	100 107 104
5				0.271	0.104	82	6.24	59.79	1545	103 102 102
6				0.335	0.150	103	6.91	52.42	1334	98 99 98
7				1.824	0.880	613	6.42	53.19	1354	104 102 103
8				0.190	0.089	60	6.25	50.63	1311	103 101 102
9				0.641	0.284	170	5.67	45.02	1162	99 95 96
11				1558	0.769	553	6.83	54.20	1394	103 103 103
12				1.852	0.926	638	6.81	53.10	1338	99 99 99
13				1.460	0578	404	6.40	52.06	1359	100 94 96
14				3.843	2.018	1405	7.72	54.16	1354	107 104 106
15				1.746	0.909	653	6.98	52.99	1347	100 117 113
20				2.408	1.162	849	5.78	55.50	1421	109 105 107

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

ISOKINETICS = 95.5%

Sampling Time Per Point, Min
3

Before

After

TEST NUMBER 2
DATE 10-16-78
OPERATOR JD
FUEL
SITE E
PROBE LOCATION FROM T

Sample Point	Time	METER CONDITIONS ΔP_s	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
PORT #6 1		.03	.18	3901.79	540	330	290		95	82		1.2
2		.02	.12	3902.56	530	350	320		75	85		1.0
3		.02	.12	3903.34	500	160	280		80	90		1.0
4		.03	.18	3904.27	465	290	250		75	90		1.1
PORT #5 1		.06	.36	3905.56	520	180	280		87	95		1.8
2		.03	.18	3906.46	525	300	290		78	97		1.1
3		.04	.24	3907.54	500	190	250		80	100		1.3
4		.05	.30	3908.70	495	330	280		75	100		1.5
PORT #4 1		0										
2		0										
3		.03	.18	3909.60	480	230	250		90	105		1.2
4		.05	.30	3910.80	460	340	290		80	105		1.5
PORT #3 1		0										
2		0										
3		.05	.30	3911.95	490	170	295		97	110		1.5
4		.04	.24	3912.96	400	320	310		90	110		1.2
PORT #2 1		.03	.18	3913.92	500	170	340		100	110		.7
2		.02	.12	3914.61	505	200	330		80	110		.9
3		.02	.12	3915.31	480	160	300		90	110		1.2
4		.03	.18	3916.22	400	290	300		90	110		2.3
PORT #1 1		.09	.54	3917.85	540	170	280		83	110		1.0
2		.02	.12	3918.65	520	300	300		80	110		1.0
3		.03	.18	3919.55	480	170	290		90	110		1.0
4		.04	.24	3920.58	445	310	290		80	110		1.2
Average		.035	.21	—	493							

METER VOL. END 3920.58
START 3900.66
SAMPLE VOL 19.92 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-.82 H_2O	29.67

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = Noz(Actual)= 7.917×10^{-4} ft^2

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	120	100	20
#2	100	100	0
#3	0	0	0
		Total	

#4	g(End)	g(Start)	Δgrams
Silica Gel	150.5	143	7.5
		Total Vol. H_2O	27.5 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

Sampling Time Per Point, Min
4

Before

After

ISOKINETICS = 95.6

TEST NUMBER 2

DATE 11-16-78

OPERATOR R.AP

FUEL

SITE E

PROBE LOCATION ECON. OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
								Impingers				
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	In	Out	Meter		
PORT F 1	14:47	.07	.46	3619.55	315	260	300		80	110		4.3
2		.05	.33	3621.33	320	265	300		78	110		3.8
3		.04	.27	3622.75	320	300	300		75	110		3.2
4		.02	.13	3623.83	320	310	300		75	111		2.2
PORT E 1		.04	.27	3625.37	320	250	295		70	118		3.2
2		.0	.27	3626.79	320	320	275		70	120		3.2
3		.03	.21	3628.15	320	310	280		70	122		2.8
4		.03	.21	3629.40	320	310	270		71	122		2.8
PORT G 1		.10	.69	3631.70	320	250	300		71	128		5.7
2		.07	.48	3633.64	320	265	305		71	128		4.4
3		.05	.34	3635.35	320	300	305		70	129		3.6
4		.05	.34	3636.95	320	320	315		70	131		3.7
PORT H 1		.11	.76	3639.43	310	260	295		70	132		6.3
2		.11	.76	3641.83	315	260	300		70	133		6.3
3		.07	.48	3643.73	320	300	305		70	135		4.4
4		.08	.55	3645.85	320	310	310		72	136		5.0
PORT A 1		.03	.21	3647.21	—	250	260		78	130		2.8
2		.01	.05	3647.74	—	250	260		78	128		2.0
PORT B 1		.07	.48	3649.70	—	250	255		72	128		4.4
2		.02	.14	3650.81	—	275	270		70	125		2.4
PORT C 1		.10	.70	3653.27	—	250	290		70	125		6.0
2		.05	.34	3654.82	—	280	270		70	126		3.8
PORT D 1		.10	.70	3657.34	—	250	285		75	128		6.2
2		.11	.76	3659.740	—	285	290		70	129		6.6
Average		.06	.41	——	318.7	——						

METER CORR. 1.0516

METER VOL. END 3659.740

START 3617.573

SAMPLE VOL 44.342 ← CORR

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-3.6" H_2O	29.67

Percent O_2 =

Nomograph Setup

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

ΔH_g = Noz(Ideal)=

% H_2O = Noz(Actual)= 7.6699×10^{-4}

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	148	100	48
#2	106	100	6
#3	0	0	0
		Total	54

#4	g(End)	g(Start)	Δgrams
Silica Gel	164	155	9

Total Vol. H_2O 63 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min — Before — After

Sampling Time Per Point, Min
3

ISOKINETICS = 88.9 %

TEST NUMBER 3
DATE 10-17-78
OPERATOR JD
FUEL
SITE E
PROBE LOCATION Blower

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT #1 1		.04	.66	3931.88	485	300	240		70	80		3.0
2		.02	.34	3933.29	470	325	262		80	82		1.8
3		.03	.51	3934.94	425	250	260		80	85		2.3
4		.045	.76	3936.87	380	270	275		71	88		4.0
PORT #2 1		.01	.19	3937.86	460	280	270		85	91		1.2
2		.01	.19	3938.84	460	300	290		78	91		1.2
3		.03	.55	3940.48	450	160	280		80	92		2.5
4		.06	1.1	3942.81	380	280	250		72	95		5.0
PORT #3 1		.015	.28	3943.72	450	210	280		81	98		1.2
2		.02	.34	3945.07	460	270	290		78	100		2.0
3		.03	.55	3946.71	455	220	290		81	100		2.5
4		.03	.55	3947.11	400	320	300		81	100		2.5
PORT #4 1		0										
2		.006	.11	3948.68	460	300	300		90	100		1.0
3		.03	.55	3950.33	440	180	280		81	100		2.5
4		.03	.55	3952.00	350	310	290		80	100		2.5
PORT #5 1		.03	.55	3953.61	450	—	285		75	100		2.5
2		.025	.46	3955.12	460	190	300		71	100		2.2
3		.02	.37	3956.42	440	300	280		71	100		2.0
4		.025	.46	3957.91	360	300	300		71	105		2.2
PORT #6 1		.045	.03	3959.90	480	320	280		72	105		4.7
2		.02	.37	3961.25	475	290	290		72	102		2.0
3		.03	.55	3962.89	460	280	280		73	100		2.7
4		.02	.37	3964.19	380	285	285		72	102		2.0
Average		.027	0.49	—	436							

METER VOL. END 3964.19
START 3930.00
SAMPLE VOL. 34.19 ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-.40 H_2O	29.35

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = Noz(Actual)= 1.3909×10^{-4} ft^2

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	133	100	33
#2	4	100	4
#3	0	0	0
		Total	37

	g(End)	g(Start)	Δgrams
Silica Gel	153.9	148.7	5.2
		Total Vol. H_2O	42.7 ml

PARTICULATE

DATA

PRORATED

Leak Check Rate — Vac in. Hg — ft^3/min

ISOKINETICS = 104.5%

Sampling Time Per Point, Min	
5	Before
	After

TEST NUMBER 3
DATE 11-18-78
OPERATOR R.A.P.
FUEL
SITE E
PROBE LOCATION MECH-0

Sample Point	Time	METER CONDITIONS ΔPs	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
PORT #1 1	.187 NOZ	.47	.22	3661.97	280	280	250		50	55		2.8
2		.57	.26	3664.05	280	280	270		50	55		—
3		.74	.34	3666.43	280	280	280		50	60		3.7
4		.85	.40	3668.93	280	280	300		50	60		4.0
5		1.10	.50	3671.67	280	280	290		50	68		4.8
6		1.20	.55	3674.59	280	280	300		50	70		5.2
PORT #2 1		.65	.27	3676.64	280	260	310		50	70		—
2	↓	.44	.17	3678.17	280	290	300		50	68		2.2
3	.246 NOZ	.04	.02	3678.91	280	250	260		52	70		22.0
4		.60	—	—	—	—	—	—	—	—	—	—
5		.10	.14	3680.42	280	280	270		52	70		2.4
6		.24	.33	3682.62	280	300	280		50	71		3.8
PORT #3 1		-.03	—	—	—	—	—	—	—	—	—	—
2		-.03	—	—	—	—	—	—	—	—	—	—
3		.04	.03	3683.28	280	270	260		52	72		22.0
4		.12	.17	3684.91	280	285	260		52	72		2.3
5		.23	.32	3687.10	280	290	270		50	75		3.8
6		.33	.46	3689.61	280	290	270		50	76		4.9
PORT #4 1		-.07	—	—	—	—	—	—	—	—	—	—
2		-.05	—	—	—	—	—	—	—	—	—	—
3		0.00	—	—	—	—	—	—	—	—	—	—
4		.09	.12	3691.09	280	270	250		52	78		2.2
5		.22	.32	3693.37	280	300	270		52	80		3.5
6	↓	.29	.43	3696.069	280	290	270		52	80		4.3
Average		.1525 / .17	—	19.124 / 18.822								

METER VOL. END [ ] START 3659.984 SAMPLE VOL [ ] ft^3

C_{pitot}	Stack Press. In. Ho-Gauge	Barometric Pressure
.837	-.20 "H_2O	29.35

Percent O_2 = [ ]

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = Noz(Actual)= .187 / .246

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	132	100	32
#2	102	100	2
#3	0	0	0
		Total	34

	g(End)	g(Start)	Δgrams
Silica Gel	156.0	148.5	7.5
		Total Vol. H_2O	41.5 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min — Before — After

Sampling Time Per Point, Min
3

ISOKINETICS = 98.8 %

TEST NUMBER 4-
DATE 11-20-78
OPERATOR JD
FUEL
SITE E
PROBE LOCATION BLROUT

Sample Point	Time	METER CONDITIONS ΔPs	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
PORT #3 1		.03	.55	4001.89	530	150	250		70	105		3.0
2		.03	.55	4003.99	540	240	275		75	105		3.0
3		.09	1.7	4006.26	540	200	270		80	105		7.5
4		.075	1.4	4008.80	420	290	275		71	105		6.2
PORT #2 1		.07	1.3	4011.24	560	170	280		90	100		6.2
2		.07	1.3	4013.72	550	260	282		70	100		6.2
3		.055	1.0	4015.80	540	180	260		80	100		5.2
4		.08	1.5	4018.52	520	270	270		77	100		7.0
PORT #1 1		.105	2.0	4021.59	600	240	250		80	100		9.2
2		.075	1.4	4024.63	580	250	215		89	97		7.0
3		.05	.95	4026.79	560	190	220		89	95		5.5
4		.08	1.5	4029.41	460	250	230		80	95		7.0
PORT #6 1		.07	1.4	3975.79	580	330	260		81	90		6.7
2		.035	.68	3977.50	575	350	280		78	90		3.0
3		.06	1.2	3979.89	540	160	260		80	90		5.6
4		.06	1.2	3982.25	300	270	270		73	90		5.7
PORT #5 1		.06	1.1	3984.59	550	260	280		90	98		5.3
2		.08	1.5	3987.21	560	300	295		80	98		6.8
3		.055	1.0	3989.41	540	220	280		80	100		5.0
4		.06	1.1	3991.71	320	300	290		75	100		5.3
PORT #4 1		.045	.85	3993.72	540	180	230		87	100		4.7
2		.03	.55	3995.31	540	260	280		80	101		2.5
3		.06	1.1	3997.80	530	220	270		80	105		5.3
4		.07	1.3	4000.28	400	320	280		70	105		6.0
		.062	1.17	—	515							
Average		.062	1.17		515							

METER VOL. END 4029.41 START 3975.14
SAMPLE VOL. 56.270 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-.82	29.86

Percent O_2 =

Nomograph Setup:

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = Noz(Actual)= .505

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	151	100	51
#2	125	100	25
#3	0	0	0
		Total	76

#4 Silica Gel	g(End)	g(Start)	Δgrams
	154	140	14
		Total Vol. H_2O	90 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

Sampling Time Per Point, Min	Before	After
5		

ISOKINETICS = 101.3 PRORATED

TEST NUMBER 4

DATE 11-20-78

OPERATOR R.A.P

FUEL

SITE

PROBE LOCATION MECHOUT

Sample Point	Time	METER CONDITIONS ΔP_s	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
PORT #4 1	12:30	.10	.14	3697.89	330	270	295		42	52		—
2		.57	.75	3701.39	330	265	305		40	52		6.2
3		.73	.96	3705.29	335	265	290		42	53		8.0
4		.65	.87	3708.85	335	260	290		42	58		7.1
5		.42	.56	3711.83	335	260	290		42	60		4.6
6	6 min.	.04	.02	3712.73	330	250	290		42	62		<2.0
PORT #3 1		.08	.10	—	325	250	295		40	68		<2.0
2	.246 NOZ	-.02	—	—								—
3		.07	.09	3714.11	330	250	300		40	68		<2.0
4		.11	.13	3716.78	330	250	300		40	68		2.0
5		.06	.05	3717.74	330	250	300		40	69		<2.0
6		.05	.04	3718.61	335	255	305		42	70		<2.0
PORT #2 1		.15	.18	3720.35	335	250	260		42	70		—
2		.53	.64	3723.45	335	260	265		42	70		—
3		.45	.55	3726.40	335	270	270		42	71		4.8
4		.68	.82	3730.86	335	270	275		45	72		6.5
5		.48	.58	3732.80	335	270	290		45	75		4.8
6		.38	.46	3735.45	335	260	300		45	78		3.8
PORT #1 1		1.30	.52	3738.30	330	250	250		42	76		5.3
2		1.9	.78	3741.64	335	250	270		42	72		8.2
3	.187 NOZ	2.50	1.05	3745.55	335	270	280		42	72		12.0
4		2.40	.98	3749.44	340	270	300		45	75		11.0
5		2.0	.82	3752.87	340	265	300		45	75		9.0
6		1.70	.70	3756.080	340	270	300		47	78		7.1
Average		.326 / 1.96	.512	41.163 / 21.694	332 / 336							

METER CURR 1.0576

METER VOL. END 5256.080

START 3696.302

SAMPLE VOL ____ ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.831	+1.7 H_2O	29.66

Percent O_2 = ____

Nomograph Setup

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

ΔH_g = Noz(Ideal)= .187

% H_2O = Noz(Actual)= .246

=

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	176	100	76
#2	110	100	10
#3	1	0	1
		Total	87

	g(End)	g(Start)	Δgrams
Silica Gel	155	147	8

Total Vol. H_2O 95 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

ISOKINETICS = 99.5%

Sampling Time Per Point, Min	
3	Before
	After

TEST NUMBER 5
DATE 11-23-78
OPERATOR J.D
FUEL Kent Industrial
SITE E
PROBE LOCATION FLR-CMT

Sample Point	Time	METER CONDITIONS ΔP_s	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
PORT #1 1		.10	1.80	4039.19	560	320	260		81	81		6.0
2		.07	1.30	4041.61	540	340	280		81	75		6.0
3		.05	.95	4043.77	530	150	310		85	88		4.8
4		.07	1.30	4046.29	~~440~~	270	270		82	75		6.0
PORT #2 5		.045	.85	4048.36	530	160	260		89	90		4.4
6		.075	1.40	4050.99	530	280	280		75	90		6.1
7		.045	.85	4053.05	510	180	270		87	91		4.4
8		.06	1.1	4055.39	~~360~~	295	270		80	92		5.2
PORT #3 9		.035	.65	4057.23	510	185	270		89	93		3.0
10		.04	.75	4059.16	520	275	275		88	95		4.0
11		.06	1.10	4061.52	495	170	265		82	95		5.2
12		.08	1.50	4064.24	~~370~~	290	275		75	95		6.4
PORT #4 13		.045	.85	4066.27	502	170	270		82	92		4.5
14		.04	.75	4068.21	520	265	280		78	95		4.1
15		.05	.95	4070.40	520	240	270		70	93		4.8
16		.05	.95	4072.59	~~340~~	300	275		70	92		4.8
PORT #5 17		.05	.95	4074.79	520	160	270		75	92		5.0
18		.085	1.60	4077.57	540	270	280		70	91		7.0
19		.05	.95	4079.75	510	105	250		78	92		4.9
20		.06	1.1	4082.08	~~460~~	280	260		70	92		5.5
PORT #6 21		.02	.38	4083.47	550	210	265		80	91		2.0
22		.02	.38	—	540	250	275		72	91		2.0
23		.015	.28	4086.01	502	140	250		81	91		1.9
24		.05	.95	4088.21	~~370~~	302	260		72	91		5.0
Average		.053	44	—	522	—	—					

METER VOL. END 4088.21
START 4036.17
SAMPLE VOL. 52.04 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	.9 "H_2O	29.75

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔHg = Noz(Ideal) =
% H_2O = Noz(Actual) = .505

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	156	100	56
#2	104	100	4
#3	0	0	0
		Total	

#4 Silica Gel	g(End)	g(Start)	Δgrams
	158	148	10

Total Vol. H_2O 70 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min —

ISOKINETICS = 102.9 / 101.5 %

Sampling Time Per Point, Min	
5	Before
	After

TEST NUMBER 5
DATE 11-23-78
OPERATOR R.AP
FUEL Kent Industrial
SITE S & E
PROBE LOCATION MECH

Sample Point	Time	METER CONDITIONS ΔPs	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
PORT #1	12:58	1.3	.50	3759.14	330	285	295		52	65		4.5
2		1.90	.74	3762.48	330	295	305		52	62		6.3
3		2.1	.81	3765.97	330	295	305		52	65		7.0
4		2.2	.85	3769.54	330	300	320		52	70		7.7
5		2.1	.81	3773.00	330	300	320		52	72		7.1
6		1.7	.65	3776.12	335	300	315		52	78		5.8
PORT #3		.05	—									
8		0.00	—									
9		.07	.09	3777.32	330	250	290		53	80		<2.0
10		.07	.09	3779.40	330	290	290		52	90		<2.0
11		.08	.10	3779.60	330	300	295		52	81		<2.0
12		-.05	—									
PORT #4B		.21	.28	3781.59	330	280	250		52	81		2.8
14		.50	.66	3784.68	330	290	250		52	81		5.3
15		.58	.77	3788.08	330	310	280		53	88		6.2
16		.67	.88	3791.55	330	310	285		55	88		7.0
17		.42	.55	3794.39	330	290	295		55	90		4.6
18		.13	.17	3795.85	325	285	310		55	91		2.0
PORT #2A		.28	.37	3798.17	325	250	280		57	91		3.2
20		.21	.29	3800.13	325	250	285		60	92		2.8
21		.33	.44	3802.58	325	270	285		58	91		4.0
22		.48	.64	3805.61	330	270	290		63	93		5.5
23		.49	.65	3808.62	330	275	300		60	95		5.5
24		.44	.58	3811.494	330	275	300		58	97		4.8
Average		1.28 / .33	.52	20.790 / 37.199	33° / 329							

.187 (Ports #1–6)

.240 (Ports #3–24)

METER CORR 1.0516

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔHg = Noz(Ideal) =
% H_2O = Noz(Actual) = .187 / .246
=

METER VOL. END 3811.494
START 3753.350
SAMPLE VOL 57.989 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	+2.6 "H_2O	29.75

Percent O_2 =

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	156	100	56
#2	112	100	12
#3	2	0	2
		Total	70

	g(End)	g(Start)	Δgrams
#4 Silica Gel	159	148	11
		Total Vol. H_2O	81 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

ISOKINETICS = 100.0 %

Sampling Time Per Point, Min
3

Before

After

TEST NUMBER 6
DATE 12-12-78
OPERATOR JD
FUEL Industrial
SITE E
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS ΔP_s	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
PORT #6 1		.03	.55	4101.69	560	310	270		100	90		2.5
2		.03	.55	4103.34	560	325	270		79	90		2.5
3		.03	.55	4105.60	520	140	250		80	90		2.5
4		.04	.75	4106.93	460	275	250		72	91		3.0
PORT #5 1		.065	1.20	4109.31	520	180	240		80	93		5.5
2		.10	1.90	4112.27	530	280	260		65	96		8.0
3		.05	.95	4114.44	510	180	260		80	98		4.8
4		.055	1.0	4116.63	340	290	270		80	99		5.0
PORT #9 1		.03	.55	4118.24	510	180	270		85	101		2.5
2		.03	.55	4119.89	530	270	280		82	101		2.5
3		.045	.85	4121.90	505	190	260		86	101		4.6
4		.06	1.1	4124.17	420	285	280		80	101		5.5
PORT #3 1		.02	.38	4125.54	510	170	275		91	100		2.0
2		.05	.95	4127.70	520	250	300		81	100		5.0
3		.065	1.20	4130.16	520	220	290		90	100		6.0
4		.095	1.80	4132.94	500	320	300		80	100		8.0
PORT #2 1		.05	.95	4135.65	530	175	275		90	100		5.2
2		.08	1.50	4137.81	520	240	315		60	100		7.0
3		.04	.75	4139.71	500	170	300		80	97		4.6
4		.06	1.10	4142.99	480	260	315		75	95		5.9
PORT #1 1		.08	1.50	4145.89	560	280	290		81	93		7.5
2		.08	1.50	4147.49	530	310	320		88	95		7.5
3		.04	.75	4149.58	500	180	300		95	98		5.0
4		.075	1.40	4152.17	490	270	320		80	100		7.2
				4153.20								
Average		.054	1.01		512							

4153.20

METER VOL. END 4153.20
START 4100.00
SAMPLE VOL. 53.20 ft^3

C_{pitot}	Stack Press. In. H_2O Gauge	Barometric Pressure
.837	-.8" H_2O	29.29

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
$\Delta H_@$ = Noz(Ideal)=
% H_2O = Noz(Actual)= .505
=

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	165	100	65
#2	111	100	11
#3	0	0	0
		Total	76

#4 Silica Gel	g(End)	g(Start)	Δgrams
	159	148	11

Total Vol. H_2O 87 ml

PARTICULATE

DATA

NO2 – .246 – 97.6
NO2 – .187 – 98.1

Leak Check Rate — Orifice Δ H = _____

Vac ____ in. Hg ____ ft³/min

Sampling Time Per Point, Min: 5

Before

After

TEST NUMBER 6

DATE 12-12-78

OPERATOR R.A.P

FUEL Kent - Industrial

SITE E

PROBE LOCATION MECH out

Sample Point	Time	METER CONDITIONS ΔPs	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
PORT 2 1	14:12	.20	.26	3820.72	325	300	300		62	72		—
2		.20	.26	3822.65	325	310	330		62	72		2.5
3		.28	.37	3825.00								
4		.40	.53	3827.74	330	300	270		62	85		4.8
5		.29	.38	3830.05	330	300	275		62	85		3.2
6		.36	.47	3832.56								
PORT 3 7		.60										
8	6.6	.03	.03	3833.31	330	240	270		62	91		∠2.0
9		.07	.09	3834.31	325	290	295		61	91		∠2.0
10		.07	.09	3835.36	330	300	300		60	90		∠2.0
11		.05	.05	3836.08	330	295	295		60	91		∠2.0
12		.05	.05	3836.92	325	295	300		60	93		∠2.0
PORT 4 13		.11	.14	3838.35	325	250	295		62	95		2.0
14		.32	.42	3840.71	325	280	295		62	96		3.9
15	15:53	.51	.67	3843.75	325	300	300		63	98		5.5
16		.55	.42	3846.54	330	300	300		63	98		4.8
17		.37	.49	3849.13	330	300	310		62	98		4.2
18		.17	.22	3850.83	325	300	310		61	100		2.5
PORT 2 19		.99	.38	3853.17	325	250	250		60	99		2.3
20		1.55	.60	3855.95	325	265	250		60	99		4.8
21		1.90	.74	3859.21	325	275	280		60	98		6.1
22		1.95	.75	3862.41	335	290	290		60	98		6.2
23		1.90	.74	3865.54	330	290	300		60	98		6.1
24		1.40	.54	3868.305	330	290	310		60	99		4.7
-												
Average		.229 / 1.615	.38	33.777 / 18.576	327 / 328							

.246 NO2

.187 NO2

METER VOL. END 3868.305

START 3812.710

SAMPLE VOL 52.154 ft³

Time	Stack Pressure In. H2O Gauge	Barometric Pressure
.837	+1.5	29.29

Percent O_2 =

Nomograph Setting:

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

Δ Hg = Noz(Ideal) =

% H_2O = Noz(Actual) =

.246 / .187 1.4 / 4.8

Imp.	Vol. (End)	Vol. (Start)	Vol. (Net)
#1	156	100	56
#2	112	100	12
#3	1	0	1
Total			

Silica Gel: Vol. 199 − 188 = 11

Total Vol. H_2O 80 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

ISOKINETICS = 96.4

Sampling Time Per Point, Min
3

Before

After

TEST NUMBER 7
DATE 12-14-78
OPERATOR JD
FUEL
SITE E
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT #1 1		.10	1.9	4160.47	560	280	240		80	70		7.5
2		.09	1.7	4163.40	540	330	280		75	72		7.0
3		.04	.75	4165.39	520	140	280		80	75		4.0
4		.09	1.7	4168.49	500	250	300		80	78		7.0
PORT #2 1		.05	.95	4170.69	530	140	300		85	80		4.5
2		.10	1.9	4173.84	530	285	310		70	80		8.0
3		.04	.75	4175.79	570	180	290		80	82		4.0
4		.08	1.5	4178.55	500	250	280		79	82		6.2
PORT #3 1		.03	.55	4180.26	500	165	270		90	85		3.5
2		.04	.75	4182.24	570	240	280		69	85		4.0
3		.08	1.5	4184.94	510	145	250		70	85		6.2
4		.09	1.7	4187.84	500	300	270		68	85		7.0
PORT #4 1		.055	1.0	4189.65	500	170	270		75	85		4.8
2		.05	.95	4191.84	520	295	295		70	87		4.7
3		.05	.95	4193.99	500	175	280		70	90		4.7
4		.07	1.3	4196.58	380	320	290		70	90		6.0
PORT #5 1		.06	1.1	4199.04	500	180	270		78	90		5.5
2		.10	1.9	4202.11	530	290	290		68	90		8.0
3		.06	1.1	4204.47	500	180	270		75	90		5.2
4		.08	1.5	4207.18	490	320	290		75	90		6.5
PORT #6 1		.12	2.2	4210.44	560	200	290		80	92		9.0
2		.05	.95	4212.61	560	320	300		70	92		5.0
3		.08	1.5	4215.27	520	180	290		75	90		6.9
4		.08	1.5	4217.37	500	320	300		80	90		7.0
Average		0.07	1.3	—	955°R		—					

METER VOL. END 4217.37
START 4157.40
SAMPLE VOL 59.97

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	−0.8 H_2O	29.20

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔF =
ΔHg = Noz(Ideal)=
% H_2O = Noz(Actual)=
=

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	165	100	65
#2	111	100	11
#3	0	0	0
		Total	76

#4	g(End)	g(Start)	Δgrams
Silica Gel	155	142	13

Total Vol. H_2O 89 ml

PARTICULATE

DATA

Leak Check Rate — Vac. in. Hg — ft³/min

Sampling Time Per Point, Min
5

Before

After

ISOKINETICS = 103.4 .1×1 = E. 101 × .246 = .187

TEST NUMBER 7

DATE 12-14-78

OPERATOR PAT

FUEL Kent Inchnit

SITE E

PROBE LOCATION MECH VII

Sample Point	Time	METER CONDITIONS ΔPs	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
PORT #1 1		.77	.38	3871.19	325	270	285		53	71		4.2
2	14:35	1.60	.62	3891.35	325	270	300		52	72		6.2
3		1.70	.65	3877.50	325	270	310		52	58		6.3
4		2.0	.75	3880.90	330	280	310		51	62		7.2
5		1.80	.70	3884.21	330	275	310		50	60		6.9
6		1.30	.50	3886.902	330	270	300		50	70		7.0
PORT #3 7		0.00										
8		.06	.08	3887.98	325	260	260		50	71		<2.0
9		.10	.13	3889.46	330	295	290		51	71		2.0
10		.14	.17	3891.09	330	275	290		50	72		2.2
11		.06	.08	3892.21	330	275	310		51	75		<2.0
12		.05	.06	3893.1	330	280	310		52	75		<2.0
PORT #4 13		.11	.14	3894.56	325	250	270		52	75		2.2
14		.40	.54	3897.45	325	290	290		52	80		6.2
15		.47	.63	3900.47	325	290	300		52	80		7.0
16		.54	.70	3903.62	325	290	310		53	81		8.1
17		.40	.54	3906.49	325	285	310		52	81		6.2
18		.11	.14	3907.95	325	290	310		52	81		2.2
PORT #2 19		.19	.22	3909.84	320	250	270		53	80		2.9
20		.21	.29	3912.02	320	260	277		53	80		3.2
21		.37	.49	3914.66	325	295	265		53	80		5.0
22		.54	.70	3917.85	320	290	280		52	80		6.5
23		.46	.60	3920.74	325	290	260		52	81		5.8
24		.42	.55	3923.543	330	290	270		53	82		5.2
Average		1.56 / .272	.42	14.189 / 38.531	328 / 325							

.187

.24

METER VOL. END 3923.543

START 3886.654

SAMPLE VOL. 57.771 ft³

$C_{p\,itot}$	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	+ 2.0" Hg^2	29.70

Percent O_2 =

METER CORR-1.0516

Nomograph Setup:

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

ΔHg = Noz(Ideal)=

% H_2O = Noz(Actual)=

.246

.187

Imp.	Vol.(End)	Vol. (Start)	ΔVol (ml)
#1	102	100	62
#2	108	102	5
#3	0	0	0
		Total	

#4	g(End)	g(Start)	Grams
Silica Gel	157	145	12
		Total Vol. H_2O	92 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min — Before — After

Sampling Time Per Point, Min
3

ISOKINETICS = 92.8%

TEST NUMBER 8
DATE 12-15-78
OPERATOR SD
FUEL
SITE E
PROBE LOCATION Bottom Out

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
								Impingers				
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	In	Out	Meter		
Port #6 1		.05	.95	4227.18	530	300	250		80	100		4.8
2		.03	.55	4228.97	520	330	270		72	100		3.2
3		.06	1.1	4231.25	500	150	245		80	105		5.0
4		.07	1.3	4233.76	470	270	260		72	108		5.5
Port #3 1		.045	.85	4235.65	490	170	260		90	110		4.0
2		.10	1.9	4238.53	520	260	270		75	110		7.2
3		.04	.75	4240.41	490	180	250		85	110		4.0
4		.025	1.4	4242.95	480	300	270		78	115		6.0
Port #4 1		.04	.75	4244.81	490	180	280		90	115		4.0
2		.05	.95	4246.92	500	280	290		80	115		4.8
3		.05	.95	4248.67	500	200	290		85	120		4.8
4		.08	1.5	4251.30	490	310	300		80	120		6.5
Port #3 1		.02	.38	4252.53	500	200	300		95	120		3.0
2		.04	.75	4254.38	500	300	310		80	120		4.0
3		.07	1.3	4256.78	500	280	310		90	120		5.8
4		.09	1.7	4259.55	500	370	320		70	120		7.0
Port #2 1		.05	.95	4261.62	520	170	320		90	120		4.9
2		.08	1.5	4264.22	530	290	320		80	123		6.8
3		.04	.75	4266.04	500	200	300		90	125		4.0
4		.07	1.3	4268.44	490	310	315		85	125		6.0
Port #1 1		.08	1.5	4270.94	560	260	320		100	125		6.5
2		.05	.95	4272.99	530	340	330		95	125		5.0
3		.05	.95	4275.03	510	240	310		100	123		5.0
4		.08	1.5	4277.61	480	350	330		90	123		7.0
Average		.059	1.10		505							

METER VOL. END 4277.61
START 4225.00
SAMPLE VOL. 52.61 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = 6.8 Noz(Actual)=

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	154	100	54
#2	112	100	12
#3	0	0	0
		Total	66

#4 Silica Gel	g(End)	g(Start)	Δgrams
	154.5	147	12.5
		Total Vol. H_2O	78.5 ml

PARTICULATE

DATA

102.8 — .246 NOZ
100.3 — .187 NOZ

Leak Check Rate — ISOKINETICS = ____

Vac — in. Hg — ft³/min

Sampling Time per Traverse Point: 5

Before

After

TEST NUMBER 8

DATE 12-15-78

OPERATOR R.A.P.

FIELD Kurt-Imbdrick

SITE E

PROBE LOCATION MECA

Sample Point	Time	METER CONDITIONS ΔPs	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
PORT 2 1	13.30	.21	.25	3925.97	310	260	305		60	55		3.1
2	.246 NOZ	.11	.14	3927.59	310	280	300		58	58		2.2
3		.26	.34	3930.60	300	275	290		52	60		3.6
4		.35	.46	3932.62	300	275	290		52	61		4.1
5		.32	.42	3935.33	310	270	295		51	65		4.0
6		.38	.50	3938.10	310	270	290		50	68		4.5
PORT 3 7		-0.05										
8		0.00										
9		.09	.12	3939.62	305	270	285		51	70		2.0
10		.05	.06	3940.59	310	270	295		51	71		<2.0
11		.04	.05	3941 52	310	270	290		51	71		<2.0
12		.04	.05	3942 47	310	270	300		51	71		<2.0
PORT 4 13		.10	.13	3943.91	310	250	280		52	72		<2.0
14		.29	.38	3946.34	305	290	290		52	72		3.7
15		.51	.67	3949.48	305	295	295		52	73		5.9
16		43	.56	3952.40	310	290	300		52	75		5.2
17		.33	.43	3954.95	305	285	300		52	78		4.0
18		.06	.08	3956.04	305	280	300		52	80		<2.0
PORT 1 19	.187	1.1	.42	3958.59	310	250	270		53	80		4.3
20		1.40	.54	3961.49	310	270	270		53	80		5.3
21		1.70	.65	3964.58	310	290	280		53	80		6.3
22		1.70	.65	3967.68	310	280	280		53	80		6.3
23		1.60	.61	3970.69	310	270	280		53	81		6.0
24		1.30	.50	3973.478	310	280	280		53	81		5.1
Average		.223 / 1.46	.36	33.935 / 19.337	306 / 308							

METER CORR 1.0516

METER VOL. — Start 3973.478 — Finish 3123 774.3

Traverse Time	Stack Press.	Barometric Pressure
.837	+2.2" H_2O	29.00 (")

Percent O_2 =

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

ΔHg = Nozzle Dia. =

% H_2O = Nozzle Area = .246 / .187

Imp.	Vol. (Grad)	Vol. (Start)	Vol. (Fin)
#1	152	100	52
#2	108	100	8
#3	0	0	0
Total			

	g (End)	g (Start)	Grams
Silica Gel	158	147	11

Total Vol. H_2O 71 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

Sampling Time Per Point, Min	
3	Before
	After

ISOKINETICS = 91.5%

TEST NUMBER 9
DATE 12-16-78
OPERATOR JD
FUEL Kent. Ind.
SITE E
PROBE LOCATION Boiler Out

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port #1 / 1		.07	1.3	4287.74	540	290	280		85	80		6.0
2		.05	.95	4289.99	520	310	290		70	78		4.8
3		.04	.75	4291.98	500	120	250		70	80		4.0
4		.07	1.3	4294.57	460	270	260		70	80		6.0
Port #2 / 1		.05	.95	4296.86	500	150	260		80	70		4.8
2		.07	1.3	4299.47	500	270	290		70	80		6.0
3		.03	5.5	4301.24	470	150	280		80	80		3.8
4		.05	.95	4303.47	470	270	300		72	80		5.0
Port #3 / 1		.025	.45	4305.04	490	200	285		80	80		3.5
2		.35	.65	4306.88	500	360	300		75	80		4.0
3		.05	.95	4309.16	480	200	300		80	80		5.0
4		.065	1.2	4311.65	460	320	320		72	80		6.1
Port #4 / 1		.04	.75	4313.65	460	170	300		80	80		4.5
2		.04	.75	4315.65	500	280	320		75	80		4.5
3		.04	.75	4317.67	480	180	280		80	80		4.5
4		.06	1.1	4320.06	470	310	300		72	80		5.3
Port #5 / 1		.04	.75	4322.12	480	160	260		72	80		4.8
2		.09	1.7	4325.02	500	280	275		72	80		8.0
3		.03	.55	4326.96	470	140	260		80	80		4.0
4		.065	1.2	4329.45	460	300	290		80	82		6.0
Port #6 / 1		.06	1.1	4331.84	520	140	280		80	83		5.9
2		.03	.55	4333.50	510	300	315		80	85		4.0
3		.06	1.1	4335.85	470	140	260		82	90		5.9
4		.06	1.1	4338.22	460	300	300		90	90		5.9
Average		.06	.91		486.25							

METER VOL. END 4338.22
START 4285.00
SAMPLE VOL. 53.22 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		29.00

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = 6.1 Noz(Actual)=
=

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	147	100	47
#2	108	100	8
#3	0	0	0
		Total	55

#4 Silica Gel	g(End)	g(Start)	Δgrams
	155.5	140	15.5
		Total Vol. H_2O	70.5 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft³/min

PARTICULATE = .187 — 99.1 / .246 — 97.6

TEST NUMBER 9

DATE 12-10-74

OPERATOR R.A.P.

FUEL KENT-INDUST

SITE E

PROBE LOCATION MECH OUT

Sampling Time Per Point, Min	
5	Before / After

Sample Point	Time	METER CONDITIONS ΔPs	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
PORT #1 1	13:24	.74	.28	3975.83	310	250	300		60	75		3.2
2		1.10	.42	3978.43	310	300	290		62	75		4.5
3	.187 NOZ.	1.30	.50	3981.22	310	270	305		61	78		5.2
4		1.40	.54	3984.05	310	280	310		58	81		5.6
5		1.20	.46	3986.54	310	285	310		57	83		4.5
6		.95	.36	3988.78	310	285	310		55	88		3.8
PORT #3 7		-.03										
8		.07	.09	3989.97	310	300	300		52	90		<2.0
9		.07	.09	3991.19	310	290	310		55	90		<2.0
10	.246 NOZ.	.03	.04	3992.05	310	300	310		55	90		<2.0
11		.04	.05	3993.00	310	275	310		55	90		<2.0
12		.04	.05	3993.83	305	295	310		55	92		<2.0
PORT #4 13		.12	.16	3995.41	300	250	295		55	95		2.2
14		.21	.28	3997.40	300	295	295		53	96		3.2
15		.34	.45	3999.98	305	295	300		55	96		4.8
16		.36	.47	4002.52	305	295	310		55	96		—
17		.28	.37	4004.75	300	300	300		55	98		4.0
18		.14	.18	4006.30	300	295	300		55	100		2.2
PORT #2 19		.21	.28	4008.25	305	250	260		55	99		3.2
20		.20	.26	4010.19	305	300	280		55	98		3.2
21		.33	.44	4012.62	305	310	280		55	98		4.8
22		.38	.50	4015.35	300	300	285		55	99		5.2
23		.37	.49	4017.80	305	295	300		56	100		4.8
24		.24	.32	4019.922	300	290	290		55	100		3.6
Average		1.115/.202	.304	15.827/32.749	310/304							

METER VOL. END — START 3973.730 — SAMPLE VOL. — ft³

METER 1.0516 / ORIFICE

Nomograph Setup

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔF =

ΔHg = Noz(Equal) =

% H_2O = 1/6 Noz(Actual) = .187 / .246

Percent O_2 =

Pitot	Stack Press. In. Hg Gauge	Barometric Pressure
.837	-.32" H_2O	29.00

Imp.	Vol.(End)	Vol. (Start)	Δ(Vol.(ml))
#1	142	100	42
#2	105	100	5
#3	0	0	
		Total	47

	g(End)	g(Start)	Δgrams
Silica Gel	153	141	12

Total Vol. H_2O 59 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

Sampling Time Per Point, Min
3

Before

After

ISOKINETICS = 96.7%

TEST NUMBER 11
DATE 12-18-78
OPERATOR JD
FUEL NEAT-END.
SITE E
PROBE LOCATION PLR OUT

Sample Point	Time	METER CONDITIONS ΔP_s	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
PORT #5 1		.02	.38	4351.45	520	320	180		80	80		3.9
2		.02	.38	4352.87	520	330	180		68	80		2.9
3		.06	1.10	4355.26	490	150	200		72	80		4.5
4		.06	1.1	4357.62	470	270	220		68	80		4.5
PORT #5 1		.06	1.1	4360.02	500	140	200		80	80		4.5
2		.08	1.5	—	500	280	220		69	80		6.0
3		.05	.95	4364.92	480	170	200		69	80		4.1
4		.07	1.3	4367.49	480	285	240		70	82		5.2
PORT #4 1		.055	1.0	4369.75	490	108	270		85	85		4.7
2		.06	1.1	4372.11	500	330	260		75	85		5.0
3		.055	1.0	4374.36	480	200	240		90	89		4.9
4		.06	1.1	4376.71	470	300	280		80	90		5.1
PORT #3 1		.03	.55	4378.48	490	180	250		90	90		3.8
2		.03	.55	4380.20	500	330	250		70	90		3.8
3		.07	1.3	4382.71	480	190	250		80	90		6.0
4		.08	1.5	4385.41	500	290	280		70	90		6.2
PORT #2 1		.06	1.1	4387.73	520	245	280		72	90		5.2
2		.07	1.3	4390.30	580	330	280		70	90		6.0
3		.04	.75	4392.25	510	190	260		75	90		4.8
4		.075	1.4	4394.84	500	310	280		75	90		6.5
PORT #1 1		.07	1.3	4397.34	560	215	260		70	90		6.0
2		.065	1.2	4399.81	540	350	280		75	85		5.9
3		.03	.55	4401.50	570	215	270		90	85		4.0
4		.08	1.5	4404.21	500	350	280		80	89		7.0
		0.056	1.04	—	—	—	—	—	—	—	—	—
Average		↓	↓	—	502		—	—	—	—	—	

METER VOL. END 4404.21
START 4350.00
SAMPLE VOL. 54.21 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-.82" H_2O	28.40

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = Noz(Actual)= 1.349×10^{-3}

Imp.	Vol.(End)	Vol. (Cart)	ΔVol.(ml)
#1	154	100	54
#2	108	100	8
#3	0	0	0
		Total	62

#4 Silica Gel	g(End)	g(Start)	Δgrams
	157.5	149	9.5
		Total Vol. H_2O	71.5 ml

PARTICULATE

DATA

Sonic Clock Rate — Isokinetics = .187 NO2 - 100.1 / .246 NO2 - 101.6

Vac. in. Hg — ft³/min

Sampling Time Per Point, Min
5.0

Before

After

TEST NUMBER 11

DATE 12-18-78

OPERATOR RP

FUEL Kuwait

SITE E

PROBE LOCATION Head air

Sample Point	Time	METER CONDITIONS ΔPs	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
PORT #1 1		.18	.39	4022.76	310	290	300		52	61		7.4
2		1.50	.58	4026.05	305	290	310		52	62		6.1
3		1.70	.65	4029.23	305	280	310		52	68		5.8
4		1.90	.74	4032.52	310	280	315		51	68		6.6
5		1.70	.65	4035.66	310	270	310		52	72		5.8
6		1.1	.42	4038.24	310	280	310		52	73		4.0
PORT #3 7		+.05										
8		0.00										
9		.05	.06	4039.27	315	250	280		49	76		22.0
10		.11	.14	4040.75	310	280	280		49	78		2.0
11		.10	.13	4042.32	310	280	280		49	78		22.0
12		0.00										
PORT #4 13		.13	.17	4043.83	305	250	250		49	82		2.0
14		.38	.44	4046.47	310	280	270		48	82		4.0
15		.46	.61	4049.49	310	270	285		48	82		5.3
16		.50	.66	4052.52	310	285	290		49	82		5.3
17		.36	.48	4055.18	310	280	300		49	85		4.2
18		.13	.17	4056.65	310	280	310		48	89		2.0
PORT #2 19		.32	.42	4059.28	310	250	300		48	87		4.0
20		.23	.30	4061.35	310	290	310		48	85		3.0
21		.42	.56	4064.23	310	290	310		49	85		5.0
22		.52	.67	4067.32	315	290	310		50	85		6.0
23		.48	.64	4070.38	310	290	310		51	85		6.0
24		.42	.56	4073.230	310	290	310		51	85		5.3
Average		148/24	.45	18.832 / 36.205	310							

METER VOL: Start 4020.352; Finish ; ft³

Factor	Stack Pressure, in. Hg	Stack Temperature, °F
.6337	+1.9 "H₂O	28.40

Particulate Cp =

Isokinetic Rate:

Pmeter = ; Pstack = ; Tmeter = ; Tstack = ; Qstd = ; Qact = ; % H₂O = 68

Trav.	Vol. (Start)	Vol. (Start)	(Volume)
#1	164	102	64
#2	108	100	8
#3	0	0	
		Total	72

NO2 .187 NO2 .246

	(Start)	(Finish)	(Volume)
Meter Vol.	152.5	142	10.5
		Total Vol. H₂O	82.5

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PARTICULATE

DATA

Leak Check Rate

Vac in. Hg ft³/min

Before

After

Sampling Time Per Point, Min
3

ISOKINETICS = 103.2 %

TEST NUMBER 12

DATE 12-20-78

OPERATOR JD

FUEL

SITE 6

PROBE LOCATION EQUIP

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
PORT 1 1		.08	1.5	4412.09	550	380	200		70	60		6.0
2		.065	1.2	4414.51	540	360	200		75	70		5.0
3		.04	.75	4416.56	500	180	200		80	70		3.8
4		.08	1.50	4419.35	480	250	220		70	70		6.0
PORT 2 1		.05	.95	4421.57	580	150	210		70	70		4.5
2		.06	1.10	4424.04	520	240	230		75	70		4.9
3		.04	.75	4426.09	500	140	220		80	70		4.0
4		.07	1.30	4428.67	580	250	230		80	72		5.0
PORT 3 1		.025	.46	4430.27	560	150	200		80	72		3.0
2		.03	.55	4431.99	520	235	230		78	72		3.2
3		.065	1.20	4434.49	500	140	210		80	72		5.0
4		.085	1.60	4437.41	500	280	220		70	72		—
PORT 4 1		.06	1.10	4439.76	500	150	215		72	72		4.9
2		.04	.75	4441.76	520	230	230		72	72		4.0
3		.06	1.10	4444.21	480	140	200		75	71		5.0
4		.08	1.50	4446.99	490	250	220		72	72		6.0
PORT 5 1		.07	1.30	4449.62	600	150	200		78	70		5.5
2		.095	1.80	4452.81	530	210	215		75	71		7.8
3		.045	.85	4455.00	500	160	210		80	71		4.3
4		.07	1.3	4457.56	500	270	220		78	71		5.5
PORT 6 1		.08	1.50	4460.40	550	150	215		85	70		6.1
2		.04	.75	4462.42	540	260	200		80	70		4.0
3		.05	.95	4464.68	500	150	200		88	70		4.9
4		.05	.95	4466.95	500	270	220		85	70		4.9
Average		.059	1.11	—	509							

METER VOL. END 4466.95

START 4409.28

SAMPLE VOL. 57.77 ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	−.82 H_2O	28.48

Percent O_2 =

Nomograph Setup

P_{meter} = C =

Pstack = T_{stack} =

T_{meter} = ΔP =

ΔH_g = Noz(Ideal)=

% H_2O = Noz(Actual)= 1.3409×10^{-3} ft²

=

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	162	160	62
#2	113	100	13
#3	0	0	0
		Total	75

#4 Silica Gel	g(End)	g(Start)	Δgrams
	160.2	148	12

Total Vol. H_2O 87 ml

PARTICULATE

DATA

.246 - 48.7
.187 - 48.4

Sampling Time per Point, Min: 5

Before
After

Test Number: 12
Date: 12-[illegible]-78
Operator: T, MR
Fuel: CRUSHED
Site: E
Probe Location: MECH

Sample Point	Time	METER CONDITIONS ΔPs	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers Out	Meter	O_2, %	Vac.
PORT #2 1	9:50	.12	.16	4075.12	315	—	250	58	72		2.0
2		.13	.17	4076.73		290	270	53	72		2.0
3		.29	.37	4079.23		300	295	50	72		3.3
4		.46	.61	4082.26		290	290	50	71		5.0
5		.36	.48	4084.85	315	300	300	49	72		4.0
6		.29	.38	4087.28		300	300	50	77		3.2
PORT #3 1		0.00									
8		.04	.05	4088.14		250	295	50	78		<2.0
9		.08	.10	4089.37		290	300	50	78		<2.0
10		.06	.08	4090.46		300	310	50	80		<2.0
11		.06	.08	4091.52		300	310	50	81		<2.0
12		.04	.05	4092.43		310	315	52	81		<2.0
PORT #4 13		.13	.17	4094.06		250	300	52	82		2.0
14		.48	.64	4097.17		290	300	52	82		5.3
15		.62	.88	4100.59		310	315	55	83		—
16		.62	.93	4104.06		315	315	55	88		7.0
17		.37	.49	4106.62		310	320	55	88		4.0
18		.09	.12	4108.01		300	310	53	90		<2.0
PORT #1 19		1.20	.46	4110.59		250	270	55	90		4.0
20		1.60	.62	4113.61		290	270	56	90		5.2
21		1.90	.74	4116.96		300	270	56	90		6.2
22		1.90	.74	4120.22		300	280	56	90		6.2
23		1.90	.74	4123.47		300	280	56	90		6.2
24		1.10	.42	4125.905		300	280	56	91		3.8
Average		.247 / 1.00	.40	36.352 / 18.818							

.187

METER VOL. End: 4125.705
Start: 4073.442
Sample Vol: 55.178 ft³

T_{pitot}	Pitot Press. Position-Tap	Barometric Pressure
.837	+2.2"H2O	28.48

Percent O_2 =

Isokinetic Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = %I =
$\Delta H_@$ = Nozzle Dia. =
% H_2O = 6.7 Nozzle Actual = .187
.246

Test	Vol. (End)	Vol. (Start)	Diff. (ml)
#1	162	100	62
#2	106	100	6
#3	1	0	1
			Total

	ml (End)	ml (Start)	Impgr.
Silica Gel	159.0	148	11
		Total Vol. H_2O	80 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

Sampling Time Per Point, Min	
3	Before
	After

ISOKINETICS = 101 %

TEST NUMBER 13
DATE 12-20-78
OPERATOR JD
FUEL Kent. Ind.
SITE E
PROBE LOCATION BLR STAT

Sample Point	Time	METER CONDITIONS ΔP_s	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
PORT 4 1		.09	1.7	4478.70	540	280	220		70	50		7.0
2		.04	.75	4480.81	520	360	240		70	55		4.0
3		.06	1.1	4483.29	480	120	280		78	60		5.0
4		.08	1.5	4486.19	460	260	190		70	60		6.8
PORT 5 1		.06	1.1	4488.61	500	160	220		80	70		5.0
2		.075	1.4	4491.33	500	300	230		70	70		6.2
3		.04	.75	4493.37	490	180	220		80	70		4.0
4		.08	1.5	4496.19	460	330	240		78	70		6.8
PORT 1 1		.04	.75	4498.20	480	200	230		90	70		4.2
2		.025	.46	4499.76	500	310	250		75	72		3.2
3		.05	.95	4502.06	480	190	240		80	70		5.0
4		.08	1.5	4504.87	470	340	250		75	75		7.0
PORT 3 1		.03	.55	4506.64	480	310	230		85	72		4.9
2		.03	.55	4508.41	480	320	260		79	73		4.8
3		.07	1.3	4511.08	480	210	250		80	72		6.6
4		.075	1.4	4513.78	460	310	240		78	72		6.8
PORT 2 1		.05	.95	4516.06	490	200	250		81	72		5.3
2		.06	1.1	4518.52	490	300	260		75	75		6.0
3		.04	.75	4520.55	470	200	250		80	78		4.9
4		.06	1.1	4523.07	470	330	260		75	78		6.0
PORT 1 1		.08	1.5	4525.87	500	150	245		80	78		8.0
2		.06	1.1	4528.25	500	300	290		75	78		6.0
3		.04	.75	4530.30	480	190	290		80	75		5.0
4		.06	1.1	4532.70	470	320	250		75	80		6.2
Average		0.057	1.07	57.11	486							

METER VOL. END 4532.70
START 4475.59
SAMPLE VOL 57.11 ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-.80 H_2O	28.53

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = Noz(Actual)= $1.3909 \times 10^{-3} A^2$
=

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	145	100	45
#2	112	100	12
#3	2	0	2
		Total	59

#4 Silica Gel	g(End)	g(Start)	Δgrams
	159	148	11
		Total Vol. H_2O	70 ml

PARTICULATE

DATA

.187 — 102.0
.246 — 93.8

Total Flow Rate: Vac. ___ in. Hg, ___ ft³ min

Sampling Time per Traverse Pt: 5.0 min

Before
After

TEST NUMBER 13
DATE 12-20-78
OPERATOR R.A.P.
FUEL CRUSHED
SITE E
PROBE LOCATION MIDWEST

Sample Point	Time	METER CONDITIONS ΔPs	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
PORT #1 1		1.1	.42	4128.97	315	270	250		50	62		4.0
2		1.7	65	4132.23	320	300	250		51	63		5.8
.187 PORT #3 3		1.9	.74	4135.59	315	290	250		52	68		6.3
4		1.9	.74	4138.99	310	290	270		53	71		—
5		1.6	.62	4142.14	315	300	280		53	72		5.3
6		1.10	.42	4144.64	315	300	290		52	74		3.8
PORT #3 7		0.00										
8		.04	.05	4145.53	310	250	280		50	79		42.0
9		.06	.08	4146.58	310	270	290		49	79		42.0
10		.07	.09	4147.75		290	310		50	80		42.0
.246 NOZZ 11		.04	.05	4149.67		300	315		51	81		42.0
12		.04	.05	4149.58		280	300		51	85		42.0
PORT #4 13		.13	.17	4151.27		250	280		51	85		2.0
14		.39	.51	4153.99		280	285		52	88		4.3
15		.52	.67	4157.08		290	300		52	90		5.5
16		.48	.64	4160.14		290	300		52	92		5.4
17		.33	.43	4162.61		300	310		52	92		4.0
18		.03	.04	4163.34		280	310		52	92		42.0
PORT #2 19		.26	.34	4165.54		250	300		53	92		3.3
20		.38	.37	4167.80		280	300		55	94		3.3
21		.37	.48	4170.47		300	310		55	94		4.2
22		.46	.60	4173.41		300	315		55	97		5.3
23		.37	.48	4176.00		300	320		55	98		4.3
24		.34	.44	4178.532		290	315		55	98		4.2
Average		1.55/.25	0.53	19.246/35.641		284						

METER CORR 1.0516

METER VOL: Start 4126.330

Tubes	Stack Press. In H₂O Gauge	Bar. Pressure In Hg Abs.
.837	+1.9" H₂O	28.48

Percent O_2 =

Equipment Setup

Probe = C =
Pitot = Pitot =
Type = CP =
Dia = Nozzle Dia =
H_2O = .64 Nozzle Area =

Imp.	Vol. End	Vol. (Start)	Vol. (ml)
#1	156	- 100	= 56
#2	108	- 100	= 8
#3		- 0	=
			Total 64

#4 Silica Gel	g (End)	g (Start)	Grams
	154	- 143	= 11

Total Vol. H_2O 75 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min — Before — After

ISOKINETICS = 96 %

Sampling Time Per Point, Min
3

TEST NUMBER 14
DATE 12-20-78
OPERATOR JO
FUEL Kent-Bnd.
SITE E
PROBE LOCATION BLR OUT

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Point #1 1		.09	1.7	4540.39	560	280	140			90		7.1
2		.07	1.3	4542.93	540	360	150			90		5.8
3		.04	.75	4544.87	530	240	180			95		4.0
4		.09	1.7	4546.77	500	350	200			98		7.1
Point #2 1		.06	1.1	4549.16	540	170	200			100		5.0
2		.07	1.3	4551.62	540	270	200			100		6.0
3		.06	1.1	4553.93	500	180	220			101		5.0
4		.08	1.5	4556.60	500	300	220			100		7.0
Point #3 1		.04	.75	4558.51	520	180	220			105		4.0
2		.03	.55	4560.16	540	200	230			109		3.8
3		.07	1.3	4562.63	520	190	230			110		6.0
4		.09	1.7	4565.46	500	330	250			110		7.8
Point #4 1		.06	1.1	4567.71	530	160	240			110		5.5
2		.05	.95	4569.84	540	260	255			110		5.0
3		.05	.95	4572.92	500	170	240			112		5.0
4		.09	1.7	4574.68	520	280	260			112		8.0
Point #5 1		.06	1.1	4576.90	530	180	240			112		5.8
2		.09	1.7	4579.30	560	260	260			112		9.0
3		.05	.95	4581.38	500	180	240			118		6.0
4		.08	1.5	4584.98	520	300	250			117		9.0
Point #6 1		.11	2.0	4587.41	570	150	250			118		12.0
2		.04	.75	4589.22	570	160	270			115		7.0
3		.06	1.1	4591.69	580	150	250			120		9.0
4		.08	1.5	4594.28	500	280	270			120		12.5
Average		.0725	1.31	56.83	526							

METER VOL. END 4594.28
START 4537.45
SAMPLE VOL ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-.82 H_2O	28.33

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal) =
% H_2O = Noz(Actual) = 1.3909×10^{-3} d^2

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	172	100	72
#2	114	100	14
#3	1	0	1
		Total	87

#4 Silica gel	g(End)	g(Start)	Δgrams
	159	148	11
		Total Vol. H_2O	98 ml

PARTICULATE

DATA

.187 – 103
.246 – 118.7

Test Time for Points, Min: 5 (Before / After)

Test # 14
Date 12-20-79
Operator K.A.H.
Type CRUSHED COAL
Site E
Test Location MECH CLAY

Sample Point	Time	METER CONDITIONS ΔPs	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Filter In	Filter Out	Meter	O_2, %	Vac.
PORT #2 1		.22	.29	4181.00		260	290		52	50		3.3
2		.18	.22	4183.00		280	305		52	50		3.0
3		.41	.54	4185.98		280	300		52	51		6.0
4		.56	.74	4189.46		280	310		52	55		8.2
5		.48	.64	4192.63		280	310		52	59		7.1
6		.42	.55	4195.58	320	280	310		52	60		5.9
PORT #4 7		.14	.18	4197.36	320	240	290		50	60		2.2
8		.42	.55	4200.30	315	270	290		50	60		5.0
9		.59	.77	4203.69		290	300		50	61		7.0
10		.52	.67	4206.95		290	310		51	62		6.2
11		.37	.48	4209.64		280	315		51	67		4.7
12		.11	.14	4211.28		270	310		51	68		2.0
PORT #3 13		.00										
14	6.1	.06	.08	4212.78								
15		.10	.13	4214.41	315	260	290		52	68		2.2
16		.15	.20	4216.30		280	310		50	62		2.5
17		.08	.10	4217.57		270	310		50	68		< 2.0
18		.04	.05	4218.58	320	270	310		50	68		< 2.0
PORT #1 19		1.1	.42	4221.29		240	280		50	67		4.8
20		1.6	.60	4224.36		270	290		50	66		6.2
21		1.8	.70	4227.59		270	290		50	65		7.1
22		1.9	.74	4231.12		270	240		50	69		7.7
23		1.60	.60	4234.11		270	240		50	70		6.0
24		1.20	.46	4236.713		260	250		50	70		5.0
Average		0.25 / 1.53	0.43	60.452 Total 17.77	318							

.246

.187

41.883 – 19.019 = 22.864

METER VOL. START 4178.852

P_{barom}	Stack Press. in Hg Vacuum	Barometric Pressure
.837	+1.8 "H_2O	26.38

Percent O_2 =

Orifice Setup

Pmeter = C =
Tstack = T_{stack} =
Tmeter = ΔP =
ΔHg = Nomo[Ideal]=
% H_2O = 7.7 Nomo[Actual]=

Imp.	Vol.[Final]	Vol.[Start]	Vol.[ml]
#1	180	100	80
#2	110	100	10
#3	1	0	1
		Total	91

#4 Silica Gel	g[Final]	g[Start]	Corrected
	159	148	11

Total Vol. H_2O 102 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

Sampling Time Per Point, Min
3

Before

After

ISOKINETICS = 100.4

TEST NUMBER 15

DATE 1-15-79

OPERATOR [illegible]

FUEL

SITE E

PROBE LOCATION Bottom Duct

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port 6		.10	1.9	4[illegible]3.16	560	100	190		68	61		7.2
2		.05	.961	4[illegible]5.37	560	150	180		80	63		4.3
3		.08	1.5	4[illegible]8.30	500	180	180		72	63		5.8
4		.08	1.5	4[illegible]1.06	500	360	240		80	65		6.0
Port 5		.07	1.2	4[illegible]3.49	520	100	200		70	69		5.0
2		.16	1.9	4[illegible]6.34	560	140	220		70	70		7.2
3		.06	1.1	4[illegible]8.85	540	230	220		80	70		4.7
4		.095	1.75	4[illegible]1.73	—	330	220		80	71		6.8
Port 4		.06	1.1	4[illegible]4.07	530	100	220		80	78		4.7
2		.05	.94	4[illegible]6.24	560	120	250		80	78		4.3
3		.07	1.2	4[illegible]8.61	—	150	230		80	80		5.2
4		.09	1.7	4[illegible]1.43	—	340	250		80	81		7.0
Port 3		.03	.55	4[illegible]3.12	530	100	240		80	82		3.5
2		.04	.75	4[illegible]5.01	540	120	270		80	82		4.0
3		.095	1.75	4[illegible]8.11	—	200	250		—	82		7.0
4		.095	1.75	4[illegible]0.94	—	340	270		—	82		7.0
Port 2		.06	1.1	4[illegible]3.25	560	100	200		—	80		5.0
2		.10	1.9	4[illegible]6.24	560	150	270		—	83		8.0
3		.06	1.1	4[illegible]8.50	—	180	260		—	87		5.2
4		.10	1.9	4[illegible]1.45	—	330	280		—	89		8.1
Port 1		.10	1.9	4[illegible]4.38	600	110	270		—	90		8.0
2		.10	1.9	4[illegible]7.33	600	150	280		—	92		8.0
3		.06	1.1	4[illegible]0.59	—	180	260		—	92		5.5
4		.10	1.9	4[illegible]2.51	—	330	280		—	90		8.2
Average		.077	1.43		547 / 1077							

METER VOL. END [illegible] START [illegible]

SAMPLE VOL. [illegible] ft^3

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
[illegible]		27.83

Percent O_2 =

Nomograph Setup

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

ΔH_g = Nox(Ideal)=

% H_2O = [illegible] Nox(Actual)=

=

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	172	[illegible]	[illegible]
#2	116	[illegible]	[illegible]
#3	1	[illegible]	[illegible]
		Total	[illegible]

#4 Silica Gel	g(End)	g(Start)	Δgrams
	[illegible]	[illegible]	[illegible]

Total Vol. H_2O [illegible] ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

Sampling Time Per Point, Min	Before	After

ISOKINETICS = .197 - 105.2 / .246 - 115.4

TEST NUMBER 1.5

DATE

OPERATOR

FUEL

SITE

PROBE LOCATION

Sample Point	Time	METER CONDITIONS ΔPs	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
		1.2	.46	4239.71		250	250		32	42		5.3
2		1.6	.61	4242.87	315	250	250		38	42		7.1
3		2.1	.80	4246.45		250	260		42	48		10.0
4		2.2	.84	4250.08		270	250		42	48		10.2
5		1.9	.73	4253.46		260	260		42	48		8.8
6		1.3	.50	4256.24		260	260		42	50		5.5
Point #1												
8		.02	.03	4257.22		240	270		38	48		2.0
9		.13	.16	4258.91		260	270		33	48		2.2
10		.12	.16	4260.58		270	280		33	49		2.2
11		.05	.06	4261.65		260	280		32	50		2.0
12		.02										
Point #1		.11	.14	4263.38		250	280		33	48		2.1
2		.44	.57	4266.39	315	270	290		38	48		5.8
3		.61	.81	4269.84		280	290		40	50		8.5
4		.55	.78	4273.35		280	300		40	52		8.2
5		.37	.49	4276.05		270	300		38	52		5.0
6		.09	.10	4277.41		260	300		35	52		—
Point #1		.26	.34	4279.74		240	240		38	52		4.0
2		.26	.34	4282.19		270	260		40	52		4.0
3		.27	.35	4284.54		250	250		40	52		4.5
4		.31	.41	4287.20		260	240		40	52		5.2
5		.29	.38	4289.59		260	240		38	53		4.6
6		.22	.29	4291.742		260	240		37	53		3.8
Average												

METER CAL. Y = .976

METER VOL. END 4291.7 ft³

START 4212.4 ft³

SAMPLE VOL. 79.3 ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837		

Percent O_2 =

Nomograph Setup

P_{meter} = C =

P_{stack} = T_{stack} =

T_{meter} = ΔP =

ΔH_g = Noz(Ideal)=

% H_2O = Noz(Actual)=

=

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	216	166	50
#2	214	166	48
#3			
		Total	98

#4 Silica Gel	g(End)	g(Start)	Δgrams
	6.3	1.5	4.8

Total Vol. H_2O 102.8 ml

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PARTICULATE

DATA

Leak Check Rate: Vac in. Hg — ft³/min

ISOKINETICS = 96.8 %

TEST NUMBER 20
DATE 1-14-79
OPERATOR JD
FUEL
SITE E
PROBE LOCATION Bottom Out

Sampling Time Per Point, Min
3

Before
After

Sample Point	Time	METER CONDITIONS			TEMPERATURES, °F						O_2, %	Vac.
		ΔP_s	ΔH	Meter Reading	Stack	Probe	Oven	Impingers In	Impingers Out	Meter		
Port #6 1		.08	1.5	4684.37	530	100	180			50		6.2
2		.03	.55	4686.14	520	150	180			51		3.6
3		.04	.75	4688.14		150	180			51		4.0
4		.055	1.0	4690.43		310	140			51		5.0
Port #5 1		.07	1.3	4692.99	500	110	200			55		5.9
2		.10	1.9	4696.15	520	130	220			55		8.0
3		.05	.94	4698.43		150	200			55		5.0
4		.10	1.9	4701.56		300	220			55		8.2
Port #4 1		.06	1.1	4703.95	500	100	220			55		5.5
2		.04	.75	4705.03	500	130	220			58		4.6
3		.11	2.0	4709.29		250	230			60		9.2
4		.10	1.9	4712.35		350	240			60		9.0
Port #3 1		.04	.75	4714.35	520	120	230			60		9.8
2		.04	.75	4716.38	540	140	230			60		4.8
3		.10	1.9	4719.48		180	230			60		9.0
4		.12	2.2	4722.81		320	250			60		11.0
Port #2 1		.06	1.1	4725.20	540	110	240			60		6.0
2		.04	1.7	4728.10	540	130	240			60		8.1
3		.06	1.1	4730.48		140	240			60		6.0
4		.10	1.9	4733.55		300	250			60		9.8
Port #1 1		.10	1.9	4736.66	560	110	250			60		9.5
2		.04	1.7	4739.56	550	160	250			60		8.8
3		.12	2.2	4742.89		140	230			60		11.5
4		.13	2.4	4746.30		310	250			60		12.0
Average		0.074	1.466		527							

METER VOL. END 4746.30
START 4681.61
SAMPLE VOL. 64.69 ft³

C_{pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	-.82	29.65

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔH_g = Noz(Ideal)=
% H_2O = 4.8 Noz(Actual)=
=

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	144	100	44
#2	112	100	12
#3		0	
		Total	56

#4 Silica Gel	g(End)	g(Start)	Δgrams
	160	148	12
		Total Vol. H_2O	68 ml

PARTICULATE

DATA

Leak Check Rate — Vac in. Hg — ft^3/min

ISOKINETICS = 105.7/99.3

Sampling Time Per Point, Min	
5	Before
	After

TEST NUMBER 20
DATE 1-11-77
OPERATOR RAP
FUEL
SITE E
PROBE LOCATION SIDE H

Sample Point	Time	METER CONDITIONS ΔP_s	ΔH	Meter Reading	TEMPERATURES, °F Stack	Probe	Oven	Impingers In	Impingers Out	Meter	O_2, %	Vac.
PORT #1	1246	.17	.22	4294.53		252	280		30	40		—
2		.16	.21	4296.52		260	290		30	43		3.3
3		.36	.47	4299.32		265	290		30	45		6.1
4		.43	.57	4302.29		270	302		32	52		7.2
5		.38	.50	4305.01		270	305		33	50		6.1
6		.37	.49	4307.75		270	315		34	51		6.1
PORT #1		.03	.04	4309.74		240	300		30	52		<2.0
2		.07	.09	4310.12		255	300		30	52		<2.0
3	3:30	.11	.14	4311.66	320	270	300		31	55		2.2
4		.13	.17	4313.40		270	300		32	58		2.4
5		.08	.10	4314.53		270	320		32	58		<2.0
6		.07	.09	4315.76		270	310		32	58		<2.0
PORT #1		.14	.19	4317.53		250	290		30	55		2.7
2		.72	.95	4321.30		275	302		35	58		12.0
* 3	1:27	.84	.32	4323.55		245	300		33	58		4.5
4		.81	.31	4325.73		270	295		33	58		4.1
5		.46	.17	4327.41		275	300		32	58		2.7
6		.06	.02	4328.04	336	270	300		32	60		<2.0
PORT #1		1.5	.57	4331.06		260	310		32	60		7.1
2		1.8	.67	4334.28		270	310		32	54		8.0
3		2.0	.75	4337.59		270	300		33	60		9.0
4		2.1	.80	4341.08		275	300		35	60		10.3
5		2.0	.75	4344.62		270	300		38	62		9.3
6		1.3	.49	4347.36		270	305	✓	38	63	✓	6.0
					332							
Average		.23 / 1.28	.317	30.275 / 27.413	332							

METER VOL. END 4347.568
START 4292.510
SAMPLE VOL 57.698 ft^3

C_{Pitot}	Stack Press. In. Hg-Gauge	Barometric Pressure
.837	+1.1" H_2O	29.65

Percent O_2 =

Nomograph Setup

P_{meter} = C =
P_{stack} = T_{stack} =
T_{meter} = ΔP =
ΔHg = Noz(Ideal)=
% H_2O = 5.7 Noz(Actual)=

METER CORR = 1.0516 .187 / .246

Imp.	Vol.(End)	Vol. (Start)	ΔVol.(ml)
#1	152	- 100	= 52
#2	114	- 100	= 14
#3	1	- 0	= 1
		Total	67

#4	g(End)	g(Start)	Grams
Silica (s)	155	- 148	= 7
		Total Vol. H_2O	74 ml

PARTICULATE LAB WORKSHEET

TEST NO. 2 BLR OUT (Inlet, Outlet) LOCATION 5.4 E

Date 11-17-78 Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	1		
BEAKER NO.			7	1	—		
DATE WT.			—	—	11-17-78		
TARE WT.	1		104.3522	49.6409	.6746		
	2		104.3518	49.6402	.6751		
	3		104.3519	49.6402	.6750		
	4		—	—	—		
AVG.			104.3519	49.6404	.6749		

POST TEST WTS.

	1		104.4768	51.4991	.7410		
	2		104.4763	51.4995	.7411		
	3		104.4765	51.5004	~~.7421~~		
	4		—	—	—		
AVG.			104.4768	51.4997	.7411		
Δ WT.			0.1249	1.8593	0.0662		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 2050.4 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 2 Economizer (Inlet, Outlet) LOCATION Site E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	4		
BEAKER NO.			6	2	—		
DATE WT.			—	—	11-17-78		
TARE WT.	1		95.5711	50.1589	.7930		
	2		95.5714	50.1584	.7931		
	3		95.5714	50.1589	.7931		
	4		—	—	—		
AVG.			95.5713	50.1587	.7931		

POST TEST WTS.

	1		95.6597	53.7064	.9201		
	2		95.6588	53.7073	.9194		
	3		95.6587	53.7074	~~.9210~~		
	4		—	—	—		
AVG.			95.6591	53.7070	.9197		
Δ WT.			0.0878	3.5483	0.1266		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 3762.7 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 3 BLR OUT (Inlet, Outlet) LOCATION Stk E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			—	3	3	
BEAKER NO.			5	11-19-78	—	
DATE WT.			—	—	—	
TARE WT.	1		102.1463	64.5806	.6838	
	2		102.1465	64.5808	.6839	
	3		102.1465	64.5809	.6839	
	4		—	—	—	
AVG.			102.1464	64.5808	.6839	

POST TEST WTS.

	1		102.2783	67.0681	.7729	
	2		102.2781	67.0688	.7731	
	3		102.2787	67.0688	.7732	
	4		—	—	—	
AVG.			102.2784	67.0686	.7731	
Δ WT.			0.1320	2.4878	0.0892	

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 2709.0 mgm REMARKS: _____

8830-5 rev

PARTICULATE LAB WORKSHEET

TEST NO. 3 MECH OUT (Inlet, Outlet) LOCATION Stk E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	6		
BEAKER NO.			8	4	—		
DATE WT.			—	11-19-78	—		
TARE WT.	1		95.0097	63.5500	.8511		
	2		95.0092	63.5501	.8512		
	3		95.0093	63.5503	.8511		
	4		—	—	—		
AVG.			95.0094	63.5501	.8511		

POST TEST WTS.

1		95.1544	63.5822	.9736		
2		95.1543	63.5819	.9732		
3		95.1540	63.5816	.9732		
4		—	—	—		
AVG.		95.1542	63.5819	.9733		
Δ WT.		0.1448	0.0318	0.1222		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 288.8 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 4 BLR OUT (~~Inlet, Outlet~~) LOCATION S.k E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			—	—	—	
BEAKER NO.			13	9	5	
DATE WT.			12-11-78	—	—	
TARE WT.	1		95.6498	64.0624	.6619	
	2		95.6502	64.0628	.6619	
	3		95.6504	64.0627	.6620	
	4		—	—	—	
AVG.			95.6501	64.0626	.6619	

POST TEST WTS.

	1		95.7943	72.4193	.7933
	2		95.7935	72.4195	.7937
	3		95.7933	72.4192	.7940
	4		—	—	—
AVG.			95.7937	72.4190	.7937
Δ WT.			0.1436	8.3564	0.1318

Δ Vlc = _____ ml

Δ DgV = _____ ft^3

Δ Mn 8631.8 mgm

LOAD _____ klb/hr

O_2 _____ %

REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 4 (Inlet, ~~Outlet~~) LOCATION 5 & E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			—	—	—	
BEAKER NO.			14	10	8	
DATE WT.			—	—	—	
TARE WT.	1		95.9798	69.0062	.8460	
	2		95.9792	69.0064	.8459	
	3		95.9791	69.0065	.8461	
	4		—	—	—	
AVG.			95.9790	69.0064	.8460	

POST TEST WTS.

	1		96.1191	69.0402	1.0459	
	2		96.1190	69.0403	1.0464	
	3		96.1180	69.0399	1.0462	
	4		—	—	—	
AVG.			96.1180	69.0401	1.0462	
Δ WT.			0.1390	0.0337	0.2002	

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 372.9 mgm REMARKS: _____

8530-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 5 BLR OUT (~~Inlet, Outlet~~) LOCATION 5.k E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			—	—	—	
BEAKER NO.			15	11	7	
DATE WT.			—	—	—	
TARE WT.	1		97.7677	69.5598	.6763	
	2		97.7681	69.5605	.6762	
	3		97.7673	69.5608	.6762	
	4		—	—	—	
AVG.			97.7677	69.5604	.6762	

POST TEST WTS.

1		97.9243	77.2277	.8066
2		97.9246	77.2274	.8071
3		97.9245	77.2282	.8070
4		—	—	—
AVG.		97.9245	77.2278	.8069
Δ WT.		.1568	7.6674	.1307

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 7954.9 mgm REMARKS: _____

8830-5 Rev.

PARTICULATE LAB WORKSHEET

TEST NO. 5 (VECH OUT) (~~Inlet, Outlet~~) LOCATION SCE

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			—	—	—	
BEAKER NO.			16	12	10	
DATE WT.			—	—	—	
TARE WT.	1		97.0280	67.8369	.8410	
	2		97.0274	67.8371	.8411	
	3		97.0268	67.8373	.8413	
	4		—	—	—	
AVG.			97.0274	67.8371	.8411	

POST TEST WTS.

	1		97.1869	67.8587	1.0481	
	2		97.1867	67.8587	1.0484	
	3		97.1870	67.8575	1.0496	
	4		—	—	—	
AVG.			97.1869	67.8593	1.0494	
Δ WT.			0.1595	0.0212	0.2073	

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 388.0 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 6 (BLR OUT ~~Inlet, Outlet~~) LOCATION Stk E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			—	—	—	
BEAKER NO.			17	23	9	
DATE WT.			—	—	—	
TARE WT.	1		104.3541	50.1588	.6696	
	2		104.3544	50.1591	.6691	
	3		104.3544	50.1592	.6695	
	4		—	—	—	
AVG.			104.3543	50.1590	.6694	

POST TEST WTS.

1		104.4988	58.1055	.8281	
2		104.4989	58.1055	.8284	
3		104.4990	58.1060	.8277	
4		—	—	—	
AVG.		104.4989	58.1056	.8281	
Δ WT.		0.1446	7.9466	0.1587	

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 8249.4 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 6 MECH (Inlet, Outlet) LOCATION

Date Box No. Eng.

Test Description

Dry Gas Meter Vol (ft^3)

Final

Initial

Δ DgV

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			—	—	—	
BEAKER NO.			18	24	12	
DATE WT.			—	—	—	
TARE WT.	1		95.0121	49.6411	.8502	
	2		95.0127	49.6414	.8498	
	3		95.0128	49.6413	.8503	
	4		—	—	—	
AVG.			95.0125	49.6413	.8501	

POST TEST WTS.

	1		95.3442	50.4749	1.1277
	2		95.3445	50.4748	1.1279
	3		95.3443	50.4750	1.1270
	4		—	—	—
AVG.			95.3443	50.4749	1.1275
Δ WT.			0.3818	0.8336	~~1.1275~~ 0.2774

Δ Vlc = ml LOAD klb/hr

Δ DgV = ft^3 O_2 %

Δ Mn 497.6 mgm REMARKS:

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 7 (BLR OUT ~~Inlet, Outlet~~) LOCATION Side E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			19	21	11		
DATE WT.			—	—	—		
TARE WT.	1		95.5738	64.5826	.6832		
	2		95.5738	64.5828	.6836		
	3		95.5740	64.5829	.6835		
	4		—	—	—		
AVG.			95.5739	64.5828	.6834		

POST TEST WTS.

	1		95.7711	75.0436	.8618		
	2		95.7702	75.0436	.8619		
	3		95.7695	~~75.0429~~	.8619		
	4		—	—	—		
AVG.			95.7703	75.0436	.8619		
Δ WT.			0.1964	10.4608	0.1785		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 10,835.7 mgm REMARKS: _____

8830-5 rev

PARTICULATE LAB WORKSHEET

TEST NO. 7 MECH OUT (Inlet, Outlet) LOCATION Site E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			20	22	14		
DATE WT.			—	—	—		
TARE WT.	1		102.1494	63.5527	.7526		
	2		102.1493	63.5524	.7529		
	3		102.1494	63.5525	.7528		
	4		—	—	—		
AVG.			102.1494	63.5525	.7528		

POST TEST WTS.

	1		102.6101	65.9574	1.1187		
	2		102.6101	65.9571	1.1177		
	3		102.6100	65.9575	1.1168		
	4		—	—	—		
AVG.			102.6101	65.9573	1.1177		
Δ WT.			0.4607	2.4048	0.3649		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 3230.4 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 8 BLROUT (Inlet, Outlet) LOCATION Side E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			—	—	—	
BEAKER NO.			29	25	13	
DATE WT.			—	—	—	
TARE WT.	1		97.7687	69.5619	.6029	
	2		97.7688	69.5618	.6030	
	3		97.7689	69.5617	.6029	
	4		—	—	—	
AVG.			97.7688	69.5618	.6029	

POST TEST WTS.

	1		97.8947	76.5926	.7461	
	2		97.8941	76.5932	.7459	
	3		97.8953	76.5933	.7451	
	4		—	—	—	
AVG.			97.8947	76.5930	.7457	
Δ WT.			0.1259	7.0312	0.1428	

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 7299.9 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 8 MECH (Inlet, Outlet) LOCATION Stk E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			30	26	15		
DATE WT.			—	—	—		
TARE WT.	1		95.9797	64.0624	.7886		
	2		95.9805	64.0630	.7888		
	3		95.9803	64.0629	.7888		
	4		—	—	—		
AVG.			95.9802	64.0628	.7887		

POST TEST WTS.

	1		96.0818	64.0726	.9672		
	2		96.0818	64.0729	.9669		
	3		96.0819	64.0724	.9661		
	4		—	—	—		
AVG.			96.0818	64.0726	.9667		
Δ WT.			0.1016	0.0098	0.1780		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 289.4 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 9 BLK OUT LOCATION Site E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			31	27	20		
DATE WT.			—	—			
TARE WT.	1		95.6512	69.0072	.6147		
	2		95.6518	69.0074	.6147		
	3		95.6517	69.0075	.6148		
	4		—	—	—		
AVG.			95.6516	69.0074	.6147		

POST TEST WTS.

	1		95.7926	74.8236	.7672		
	2		95.7925	74.8241	.7665		
	3		95.7923	74.8243	.7668		
	4		—	—	—		
AVG.			95.7925	74.8240	.7668		
Δ WT.			0.1409	5.8166	0.1521		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn = 6109.6 mgm REMARKS: _____

8830-5 rev

PARTICULATE LAB WORKSHEET

TEST NO. 9 MECH LOCATION Side E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			32	28	21		
DATE WT.			—	—	—		
TARE WT.	1		97.0273	67.8340	.7353		
	2		97.0275	67.8341	.7354		
	3		97.0278	67.8341	.7354		
	4		—	—	—		
AVG.			97.0275	67.8341	.7354		
POST TEST WTS.							
	1		97.3243	68.1735	.9626		
	2		97.3243	68.1730	.9621		
	3		97.3240	68.1727	.9624		
	4		—	—	—		
AVG.			97.3242	68.1733	.9624		
Δ WT.			0.2967	0.3342	0.2270		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 957.9 mgm REMARKS: _____

8830-5 rev

PARTICULATE LAB WORKSHEET

TEST NO. 11 BLK OUT LOCATION Site E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			36	29	22		
DATE WT.			—	—	—		
TARE WT.	1		97.7670	63.5531	.6108		
	2		97.7672	63.5533	.6110		
	3		97.7671	63.5535	.6110		
	4		—	—	—		
AVG.			97.7671	63.5533	.6109		

POST TEST WTS.

	1		97.9218	70.6048	.7803	
	2		97.9205	70.6034	.7800	
	3		97.9214	70.6026	.7803	
	4		—	—	—	
AVG.			97.9212	70.6036	.7802	
Δ WT.			0.1541	7.0503	.1693	

Δ Vlc = _____ ml

Δ DgV = _____ ft^3

Δ Mn 7373.7 mgm

LOAD _____ klb/hr

O_2 _____ %

REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 11 MECH LOCATION Site E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			37	30	23		
DATE WT.			—	—	—		
TARE WT.	1		95.9785	69.5626	.7924		
	2		95.9783	69.5621	.7926		
	3		95.9786	69.5620	.7920		
	4		—	—	—		
AVG.			95.9785	69.5625	.7926		
POST TEST WTS.							
	1		96.6206	71.2454	1.1273		
	2		96.6196	71.2457	1.1261		
	3		96.6205	71.2458	1.1259		
	4		—	—	—		
AVG.			96.6202	71.2456	1.1264		
Δ WT.			0.6417	1.6831	0.3338		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 2658.6 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 12 BLR OUT LOCATION S, L E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			38	31	24		
DATE WT.			—	—	—		
TARE WT.	1		97.0259	64.5837	.5487		
	2		97.0260	64.5843	.5989		
	3		97.0260	64.5843	.5988		
	4		—	—	—		
AVG.			97.0260	64.5841	.5988		

POST TEST WTS.

1		97.1748	70.8226	.7380		
2		97.1743	70.8226	.7382		
3		97.1743	70.8216	.7385		
4		—	—	—		
AVG.		97.1745	70.8223	.7382		
Δ WT.		0.1485	6.2382	0.1394		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 6526.1 mgm REMARKS: _____

8830-5 r

PARTICULATE LAB WORKSHEET

TEST NO. 12 MECH LOCATION SITE E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			39	32	25		
DATE WT.			—	—	—		
TARE WT.	1		95.0097	50.1595	.7852		
	2		95.0098	50.1592	.7857		
	3		95.0096	50.1596	.7855		
	4		—	—	—		
AVG.			95.0097	50.1594	.7855		

POST TEST WTS.

	1		95.7563	52.2022	1.1145		
	2		95.7553	52.2008	1.1147		
	3		95.7555	52.2002	1.1136		
	4		—	—	—		
AVG.			95.7557	52.2011	1.1143		
Δ WT.			0.7460	2.0417	.3288		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 3116.5 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 13 BLK OUT LOCATION S. de E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			40	33	26		
DATE WT.			—	—	—		
TARE WT.	1		95.6490	49.6418	.6448		
	2		95.6491	49.6425	.6452		
	3		95.6493	49.6424	.6451		
	4		—	—	—		
AVG.			95.6491	49.6422	.6450		

POST TEST WTS.

	1		95.7827	54.5368	.8014		
	2		95.7823	54.5356	.8023		
	3		95.7827	54.5346	.8019		
	4		—	—	—		
AVG.			95.7826	54.5357	.8019		
Δ WT.			0.1335	4.8935	0.1569		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 5183.9 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 13 MECH LOCATION _____

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			41	34	27		
DATE WT.			—	—	—		
TARE WT.	1		95.5720	64.0641	.7375		
	2		95.5718	64.0636	.7380		
	3		95.5713	64.0639	.7379		
	4		—	—	—		
AVG.			95.5717	64.0639	.7378		

POST TEST WTS.

	1		96.1343	65.1751	1.0101		
	2		96.1336	65.1753	1.0106		
	3		96.1339	65.1749	1.0101		
	4		—	—	—		
AVG.			96.1339	65.1751	1.0103		
Δ WT.			0.5622	1.1112	.2725		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 1145.7 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 14 BLR OUT LOCATION Site E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			42	44	28		
DATE WT.			—	—	—		
TARE WT.	1		104.3521	50.2977	.6006		
	2		104.3516	50.2977	.6010		
	3		104.3516	50.2978	.6009		
	4		—	—	—		
AVG.			104.3518	50.2977	.6008		

POST TEST WTS.

1		104.6092	63.1684	.8737		
2		104.6085	63.1669	.8736		
3		104.6091	63.1674	.8736		
4		—	—	—		
AVG.		104.6089	63.1676	.8736		
Δ WT.		0.2571	12.8699	0.2728		

Δ Vlc = _____ ml

Δ DgV = _____ ft^3

Δ Mn 13399.8 mgm

LOAD _____ klb/hr

O_2 _____ %

REMARKS: _____

8830-5 rev

PARTICULATE LAB WORKSHEET

TEST NO. 14 BTECH LOCATION SSD E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.
BOTTLE NO.			—	—	—	
BEAKER NO.			43	45	29	
DATE WT.			—	—	—	
TARE WT.	1		102.1463	50.3059	.7909	
	2		102.1459	50.3062	.7912	
	3		102.1461	50.3063	.7911	
	4		—	—	—	
AVG.			102.1461	50.3061	.7911	

POST TEST WTS.

1		103.3192	56.1989	1.2893
2		103.3181	56.1981	1.2872
3		103.3191	56.1990	1.2855
4		—	—	—
AVG.		103.3188	56.1987	1.2873
Δ WT.		1.1727	5.8926	0.4962

Δ Vlc = _____ ml

Δ DgV = _____ ft^3

Δ Mn 4561.5 mgm

LOAD _____ klb/hr

O_2 _____ %

REMARKS: _____

8830-5 rev

PARTICULATE LAB WORKSHEET

TEST NO. 15 BLK OUT (Inlet, Outlet) LOCATION Site E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			46	48	31		
DATE WT.			—	—	—		
TARE WT.	1		104.4604	50.1582	.6976		
	2		104.4589	50.1580	.6977		
	3		104.4609	50.1587	.6975		
	4		—	—	—		
AVG.			104.4601	50.1583	.6976		

POST TEST WTS.

	1		104.7975	61.0005	.8676		
	2		104.7980	61.0012	.8683		
	3		104.7973	61.0010	.8676		
	4		—	—	—		
AVG.			104.7976	61.0009	.8678		
Δ WT.			0.3375	10.8426	0.1702		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 1350.3 mgm REMARKS: _____

8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. MECH 15 LOCATION S.H E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			47	49	32		
DATE WT.			—	—	—		
TARE WT.	1		105.2133	49.6406	.7406		
	2		105.2124	49.6409	.7408		
	3		105.2137	49.6411	.7404		
	4		—	—	—		
AVG.			105.2131	49.6409	.7406		

POST TEST WTS.

	1		105.8302	52.0333	1.1165		
	2		105.8312	52.0338	1.1168		
	3		105.8309	52.0337	1.1158		
	4		—	—	—		
AVG.			105.8308	52.0336	1.1164		
Δ WT.			0.6177	2.3927	0.3758		

Δ Vlc = _____ ml LOAD _____ klb/hr

Δ DgV = _____ ft^3 O_2 _____ %

Δ Mn 3386.2 mgm REMARKS: _____

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8830-5 rev.

PARTICULATE LAB WORKSHEET

TEST NO. 20 BLK ONT LOCATION Stk E

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			52	50	33		
DATE WT.			—	—	—		
TARE WT.	1		102.1503	49.6413	~~.8683~~		
	2		102.1494	49.6411	.6810		
	3		102.1496	49.6411	.6810		
	4		—	—	.6811		
AVG.			102.1498	49.6412	.6910		

POST TEST WTS.

	1		102.3663	58.8387	.8917	
	2		102.3661	58.8386	.8914	
	3		102.3658	58.8389	.8915	
	4		—	—	—	
AVG.			102.3661	58.8387	.8915	
Δ WT.			0.2163	9.1975	0.2105	

Δ Vlc = _____ ml

Δ DgV = _____ ft^3

Δ Mn 9624.3 mgm

LOAD _____ klb/hr

O_2 _____ %

REMARKS: _____

8830-5 re

PARTICULATE LAB WORKSHEET

TEST NO. 20 MLCH LOCATION S. Ash

Date _____ Box No. _____ Eng. _____

Test Description _____

Dry Gas Meter Vol (ft^3)

Final _____

Initial _____

Δ DgV _____

Impinger Water Vol (ml)

	1	2	3	Total
Final				
Initial				
Δ Vlc				

CONTENT		H_2O RINSE	ACETONE RINSE	DRY FLASK	FILTER NO.	BLANK NO.	
BOTTLE NO.			—	—	—		
BEAKER NO.			53	51	34		
DATE WT.			—	—	—		
TARE WT.	1		95.9822	52.2483	.8236		
	2		95.9816	52.2482	.8243		
	3		95.9814	52.2482	.8240		
	4		—	—	—		
AVG.			95.9817	52.2482	.8240		

POST TEST WTS.

	1		96.7721	52.3999	1.2532	
	2		96.7701	52.3997	1.2526	
	3		96.7696	52.3994	1.2524	
	4		—	—	—	
AVG.			96.7706	52.3997	1.2527	
Δ WT.			0.7889	2.1015	0.4287	

+ 0.9881 — Form from business TEST

3.0902

Δ Vlc = _____ ml

Δ DgV = _____ ft^3

Δ Mn ~~3319.1~~ 1307.9 mgm

LOAD _____ klb/hr

O_2 _____ %

REMARKS: _____

8830-5 rev

SECTION 3.0
GASEOUS DATA

		PAGE
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GASEOUS EMISSION SUMMARY

Location: Site E

Fuel: _____

				Boiler Outlet						Stack Outlet						
TEST NO.	DATE	LOAD %	CONDITIONS	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	NO_2 ppm Wet	HC ppm Wet	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	SO_2 ppm Dry	SO_3 ppm Dry	NOTES
2	11/16/98	57	as found (tuning)	7.4	12.0	81	480			8.9	11.1	75	391			Load dropped during test
3	11/18/98	35	amb. air only	8.8	11.1	100	392			9.0	9.8	103	311			
4	11/20/98	61	as found	7.2	12.5	38	421			7.6	12.2	53	398			
5	11/21/98	44	as found	9.0	9.7	83	477			9.5	10.3	95	407			Load varied
6	12/2/98	54	low OFA	9.0	11.7	62	456			8.1	12.7	54	466			
7	12/3/98	56	high up OFA	5.2	13.9	147	367			7.0	12.3	170	392			
8	12/5/98	51	high OFA	6.8	12.5	~~364~~	369			7.5	12.2		370			
9	12/6/98	47	as found	7.7	11.6		368			8.1	11.2		393			
10	12/6/98	50.5	high up OFA	7.7	11.4		424									
b			Lower biased OFA	7.6	11.6		404									
c			high OFA	10.0	9.9		439									
d			upper biased OFA	8.2	11.1		423									
e			low OFA	8.3	11.3		435									
11	12/8/98	52	low OFA	6.5	12.9		357			6.7	12.7		335			Kentucky Ind.
12	12/20/98	56	as found	5.9	12.9		393			6.5	12.7		409			Crushed
13	12/20/98	40	as found	9.2	10.1		483			9.5	10.0		489			

129

NOTE: All parts per million (ppm) figures are corrected to a 3% O_2 constant dilution factor

#15900

GASEOUS EMISSION SUMMARY

Location: Site E

Fuel: _____

				Boiler Outlet						Stack						
TEST NO.	DATE	LOAD %	CONDITIONS	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	NO_2 ppm Wet	HC ppm Wet	O_2 % Dry	CO_2 % Dry	CO ppm Dry	NO ppm Dry	SO_2 ppm Dry	SO_3 ppm Dry	NOTES
14	12/20/78	61	as found	3.9	14.5		454			5.8	13.7		498			Crushed
15	1/5/79	59	as found	5.9	13.5		385									E. Kentucky
16	1/8/79	56	as found	8.3	11.0		360									E. Kentucky
17	1/10/79	56	as found	6.2	13.4		389									Kentucky
18a	1/12/79	54	vary air (low)	8.4	11.2		358									
b			Med	9.0	10.6		421									
c			High	9.8	10.0		435									
d			Med	9.3	10.0		428									
20	1/18/79	56	as found	7.0	12.3		405									

NOTE: All parts per million (ppm) figures are corrected to a 3% O_2 constant dilution factor

#15900

KVB

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GASEOUS EMISSIONS DATA

TEST SITE [illegible]
TEST NO # 2
DATE 11-12-73

FUEL Kent Co. Industrial Waste
LOAD Max. Load Continuous Furnace
CONDITIONS [illegible]
DATA TAKEN BY [illegible]

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
1-5	2:45	6.4	13	35	47	209	365									Paint Air
2	3:00	6.15	8	10		12										RH 18%
3	3:30	7.2	12.2	242	57	310	349									
6	3:20	6.50	12.4	141	56	256	354									Pump out
8	3:45	8.6	11.0	78	115	278	411									Working
9	4:30	11.6	10.2	75	141	243	454									
1-3-4-5	4:55	8.5	11.4	67	100	300	433									1-6 BRL Out
7-8	5:15	8.6	11.2	75	114	343	478									7-8 BRL Out #2
2	5:30	10.4	7.7	179		220										
9	5:45	8.4	12.4	55	97	256	382									9 - Stack
2-5	6:05	7.4	11.6	72	96	272	391									10 - Paint Air
																Load Change
																L.R Lower

AVERAGES

Dumping	4:15	12.2	7.5		16.5		179									
5-8	3:00	7.2	12.1		21		413									
5-8 #2	4:15	8.1	11.5		15		412									
Stack	5:45	8.4	11		9		371									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
TEST NO #3
DATE 11-15-75

FUEL
LOAD 75K
CONDITIONS Amb Air
DATA TAKEN BY MJT

Probe Position	AM Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
1-5	10:30	8.5	11.4	65	94	250	361									RH 42%
7-8	10:50	8.7	11.2	65	95	260	381									
9	11:35	10.3	9.9	60	101	225	413									
1	11:20	9.1	11.0	40	60	245	372									
2	11:25	8.6	11.4	45	65	248	361									
3	11:45	8.7	11.1	70	103	249	365									
4	12:00	8.9	10.8	110	164	250	373									
5	12:10	9.0	10.9	75	113	258	388									
7-8	12:20	9.3	10.4	80	123	260	401									
9	12:35	10.8	9.2	80	142	218	386									
1-5	12:55	8.9	11.2	65	97	270	403									
1-5	1:15	8.8	11.0	70	103	240	355									Recal
7-8	1:30	8.5	10.9	70	101	235	339									
9	1:55	8.7	10.4	45	66	230	337									

AVERAGES

BLR Out 1	9.05	8.8	11.		106		372									
BLR Out 2	9.65	8.8	10.8		106		371									
Stack	9.15	9.7	9.5		103		3[illegible]									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE [illegible] FUEL _____

TEST NO #41 LOAD 110 MW

DATE 11-20-75 CONDITIONS As Is

DATA TAKEN BY RJT

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
1-5	12:48	5.3	14.4	25	29	335	384									
7-8	12:58	5.5	14.3	30	35	345	401									
9	1:10	6.9	12.8	40	51	317	408									
10	1:20	16.3	.7	30		30										
1-5	1:33	7.6	12.2	25	34	285	384									↓ Recal
7-8	1:55	7.2	12.8	50	65	335	438									
9	2:25	8.2	11.6	38	50	215	388									
10	2:35	16.3	.7	25		20										
1	2:48	7.1	13.0	33	39	309	401									
3	2:55	7.4	12.4	30	40	325	432									
4	3:20	7.9	11.6	33	41	315	434									
5	3:43	7.6	12.0	40	54	345	464									
1-5	4:03	7.5	11.8	29	37	340	454									

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
TEST NO #5
DATE 11-21-78

FUEL Kent
LOAD 80.1 lbs
CONDITIONS As Is
DATA TAKEN BY MJ

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
1-5	12:55	10.6	9.2	38	66	270	469									
1-5	1:00	10.5	9.5	47	81	298	513									↓ calib
7-8	1:30	9.5	10.5	98	154	330	518									Load change
9	1:50	10.0	10.2	70	115	300	493									10K up thenclown
10	2:15	15.3	.65	35		20										
1-5	2:30	10.1	9.0	55	91	280	464									
7-8	2:55	9.9	9.2	115	252	323	526									
9	3:15	8.9	10.4	50	75	335	500									
10	3:40	16.0	.6	35		15										Load change
1-5	3:50	8.5	11.2	65	94	320	462									

AVERAGES

BLPout 1		9.9	9.7		83		477									
BLPout 2		9.7	9.85		203		522									
Stack		9.5	10.3		95		477									
Point Air		15.7	.63		35		18		*							

Not corrected for 3% O_2 *

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
TEST NO #6
DATE 12-12-75

FUEL Test Industrial
LOAD 37.4 K/Hour
CONDITIONS Low EA
DATA TAKEN BY MJ

Probe Position	PPM Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO cor	NO ppm(dry) unc	NO cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	N_{10} unc	N_{10} cor	HC unc	HC cor	REMARKS
1-5 *	3:20	9.1	11.2	0	0	282	425									One Probe out should be .1% lower than Probes 7-8
7-8	3:30	7.3	13.3	50	66	325	428									
9	3:50	7.8	13.2	35	48	328	445									
10	4:10	14.5	.6	20		8										
1-5 *	4:20	9.0	12.0	38	51	305	454									
7-8	4:35	7.0	14.2	38	41	311	417									
9	4:45	8.3	12.2	42	60	340	483									
10	4:55	14.3	.5	20		8										
1-5 *	5:00	8.9	12.0	45	57	325	455									
7-8	5:15	8.6	12.2	60	87	360	524									
10	5:30	14.8	.65	20		18										

AVERAGES

Blanket 1	AVG	9	11.7		62		456									
Blanket 2	AVG	7.6	13.2		67		442									
Stack	AVG	8.1	12.7		54		466									
Ambient Air	AVG	14.7	.6		20		11									

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NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
TEST NO #7
DATE 12-13-78
RH = 32%

FUEL Kentucky Ind Mine
LOAD 101.2 K lbs/hr
CONDITIONS high upper of A
DATA TAKEN BY MJ

Probe Position	PM Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
1+5	2:30	6.1	13.0	150	181	330	399									
7+8	2:50	6.0	13.0	122	147	335	402									
* 9	3:10	7.7	11.6	140	190	318	431									
10	3:30	19.5	.8	110		8										
1-5	3:40	4.9	14.2	122	136	330	369									
1-5	3:55	4.9	14.2	122	136			45	50	35	39	-10	-11			manifold may too much response in measurement of accurate for cl. of NO vs NOx span inaccurate
								23	26	25	28	-2	-2.2			
								23	26	24	27	-1	-1.1			
								21	24	24	27	-3	-3.4			Recalibrated
								38	43	41	46	-3	-3.4			NO
								40	45	40	45	0	0			used 0-100
								36	40	37	41	-1	-1.1			scale
								37	41	37	41	0	0			
7-8	4:30	6.5	12.8	122	152	310	385									
9	4:45	6.2	13.0	122	149	290	353									
10	4:55	19.8	.6	100		0										
1-5	5:10	4.8	14.2	122	136	300	333									
7-8	5:20	6.3	12.8	122	150	312	382									
10	5:35	19.3	1.0	100		2										

AVERAGES

BLR Out 1	AVG	5.2	13.9		147		367		36.9		36.7		-.2			NOx from Port 1 & 4
BLR Out 2	AVG	6.3	12.9		150		390									
Stack	AVG	6.45	12.3		170		392									
* Point A-4	AVG	19.5	.8		123		3									NO corrected for 3%

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NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE E

TEST NO #8

DATE 12-15-78

RH = 35%

FUEL Kentucky Ind Mine

LOAD [illegible]

CONDITIONS [illegible]

DATA TAKEN BY BC

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
1-5	1:35	7.3	11.7	*		210	309									#2 Broken
7+8	1:50	7.4	12.2			250	311									
10	2:10	20.3	.8			5										
1	2:20	7.3	12.5			240	352									
2	2:30	7.0	12.5			290	375									
3	2:40	6.0	13.3			340	360									
4	2:50	7.0	12.2			290	375									
5	3:05	6.4	13.0			300	370									
9	3:20	7.5	12.0			280	370									
7+8	3:40	7.4	11.9			250	311									
1-5	3:55	5.8	13.2			300	350									
1-5	4:15	6.8	12.0			250	355	125	150.7	122	154.1	-3	-3.8			
								130	150.0	123	136.4	-1	-5.9			
								123	134.3	120	152.3	3	0			
10	4:30	20.5	.5			0										

KVB

GASEOUS EMISSIONS DATA

TEST SITE 1 FUEL Kentucky - Industrial Mine

TEST NO #1-1 LOAD 55.0 MW Gross

DATE 12 16 75 CONDITIONS 4 Mills / Feed 52 Coal

RH - 45% DATA TAKEN BY WJ

Probe Position	PM Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
1-5	1:15	8.4	11.0			253	365									Load change
7-8	1:30	7.2	12.0			280	327									down 10%
1-5	1:45	7.6	11.6			280	377									
7-8	2:00	7.1	12.0			290	376									
1-5	2:15	8.1	11.1			276	377									
1-5	2:35	7.8	11.6			265	362	124.8	170.5	127.5	174.2	-3.3	-4.5			Cal Gas NO_2
								123.3	168.5	123.8	169.2	-.5	-.7			0-250 ppm
								124.2	169.4	125.0	170.5	-.8	-1.1			Range
								124.0	169.4	124.0	169.4	0	0			
								116.0	158.5	116.3	158.9	-.3	-.4			
								115.3	157.5	115.5	157.8	-.2	-.3			
								124.8	170.5	124.8	170.5	0	0			
								120.5	164.7	119.8	163.7	+.7	+1.0			
								125.2	170.8	124.8	170.5	+.2	+.3			
								118.8	162.3	118.8	162.3	0	0			
1-5	3:00	7.7	11.6			270	366	123.5	168.5	123.5	168.5	0	0			
"	3:05	8.4	11.2			260	372									
7-8	3:15	6.9	12.3			255	352									
1-5	3:30	7.2	12.0			283	377									
"	3:50	7.9	11.4			281	370									
1-5	4:05	7.6	11.6			275	370									

AVERAGES

5-8 Pm #1	A:A	7.7	11.8				265		35.1		48.3		-.4			
5-8 Pm #2	A:S	7.1	12.1				350									
5 Pm 5	10:5	8.1	11.2				373									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE E

TEST NO #10

DATE 12-17-78

FUEL Kentucky [illegible]

LOAD

CONDITIONS Change of A

DATA TAKEN BY [illegible]

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
1-5	12:00	7.9	11.2			320	441									upper low
1-5		7.5	11.6			305	407	156	205	160	214	-4	-5			lower Norm
AVG→		7.7	11.4				424									
1-5	2:00	7.6	11.6			300	404									upper Hi lower Hi
1-5	2:10	10.0	9.9			265	435	97.8	160.1	97.5	160.1	0				upper Hi lower Hi
1-5	2:20	10.0	9.9			270	445									
AVG→		10.0	9.9				439									
1-5	2:30	8.3	11.0			300	420	106.3	151	106.3	151	0				upper Hi
1-5	2:55	8.1	11.2			303	411									lower lower
AVG→		8.2	11.1				423									
1-5	3:05	8.3	11.1			310	446									
1-5	3:10	8.2	11.4			305	430	115.0	162	115.0	162	0				upper low lower low
AVG→		8.25	11.25				435									

AVERAGES

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

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15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE F

TEST NO 411

DATE 12-13-78

FUEL

LOAD 52 %

CONDITIONS

DATA TAKEN BY BC

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
10	11:45	7.8	7.5	N.A.		0										Rainy Fumes
1-5	1:55	7.8	11.6			2.8	383									
7,8	2:10	7.4	12.2			2.9	385									
10	2:40	20	0.8			0.05										
1	2:50	6.	13.2			3.1	372									
2	3:00	5.4	13.8			3.2	376									
3	3:10	5.7	13.2			3.0	353									
5	3:30	5.7	13.6			2.8	330									
9	3:40	6.4	13.0			2.6	321									
4	3:50	6.3	13.2			2.5	355									
1-5	4:10	6.5	13.8			2.1	336									
7,8	4:25	6.0	13			2.9	348									
9	4:40	7.0	12.4			2.7	345									
10	4:55	7.8														

AVERAGES

[illegible]	[illegible]	[illegible]														
[illegible]	[illegible]	[illegible]	[illegible]				3.0									
[illegible]	[illegible]	[illegible]	[illegible]				[illegible]									
[illegible]	[illegible]	[illegible]	[illegible]				[illegible]									

140

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
TEST NO. #12
DATE 12-20-79

FUEL Crushed
LOAD 100%
CONDITIONS Norm.
DATA TAKEN BY MJ

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM(WET) NOx unc	NOx cor	NO unc	NO cor	NO2 unc	NO2 cor	HC unc	HC cor	Remarks
1-5	10.00	6.2	13.0			345	415									
7-8	1010	5.1	13.8			355	402									
9	10.20	6.1	13.0			335	405									
10	10.30	19.8	.8			5	-									
~~1-5~~	~~10.40~~	~~4.7~~	~~14.1~~			~~380~~										
1-5	1100	5.7	13.0			315	371	86.5	102	887	104	+2.2	-2			Re Cal.
7-8	11.25	6.2	13.1			360	433									
9	11 30	6.8	12.3			325	413									
10	11 40	19.9	.7			10	-									
1-5	11 50	6.3	12.4			320	392									
7+8	12.00	6.3	12.8			355	435									
10	12:20	19.9	.5			5	-									
1-5	12:45	5.5	13.3			380	442									
Point A.C.	AVG.	19.9	0.7				7									
Blr Out 1	AVG.	5.9	12.9				393		102		104		-2			
Blr Out 2	AVG.	5.9	13.2				423									
Stack	AVG.	6.5	12.7				409									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

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KVB

GASEOUS EMISSIONS DATA

TEST SITE _____ FUEL _____

TEST NO _____ LOAD _____

DATE _____ CONDITIONS _____

DATA TAKEN BY _____

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
1.5	2 [illegible]	[illegible]	[illegible]			[illegible]	[illegible]									
[illegible]	2 35	8.7	[illegible]			[illegible]	[illegible]									
[illegible]	2 [illegible]	[illegible]	[illegible]			[illegible]										
[illegible]	3 [illegible]	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		-1 4			
[illegible]	3 [illegible]	[illegible]	[illegible]			[illegible]	[illegible]									
[illegible]	3 [illegible]	[illegible]	[illegible]			[illegible]	[illegible]									
[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]									
[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]									
[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]									
2	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]									
3	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]									
4	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]									
5	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]									
[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]									
[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]									
[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]									
[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]									
[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]									

AVERAGES

[illegible]	[illegible]	[illegible]	[illegible]				[illegible]	[illegible]		[illegible]						
[illegible]	[illegible]	[illegible]	[illegible]				[illegible]									
[illegible]	[illegible]	[illegible]	[illegible]				[illegible]									
[illegible]	[illegible]	[illegible]	[illegible]				[illegible]									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
TEST NO. 14
DATE 12-20-78

FUEL Crushed
LOAD 110 K lbs/hr
CONDITIONS Normal
DATA TAKEN BY JCB

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM(WET) NOx unc	NOx cor	NO unc	NO cor	NO2 unc	NO2 cor	HC unc	HC cor	Remarks
1-5	8:30	3.7	14.8			400	416									
7-8	8:56	3.5	15.4			460	473									
9	9:10	5.8	13.7			480	498									
10	9:50	18.4	0.8			8	-									
1-5	10:12	3.9	14.4			460	454									
7-8	10:35	3.2	15.2			470	475									
10	10:50	19.0	0.7			11	-									
1-5	11:15	4.0	14.2			437	463									
BLR 1	AVG.	3.9	14.5				454									
BLR 2	AVG.	3.4	15.3				474									
Stack	AVG.	5.8	13.7				498									
Paint Air	AVG.	18.7	0.7				10									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE F
TEST NO. 15
DATE Jan 5 79

FUEL
LOAD
CONDITIONS
DATA TAKEN BY

Probe Position	Am Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM(WET) NOx unc	NOx cor	NO unc	NO cor	NO2 unc	NO2 cor	HC unc	HC cor	Remarks
1-5	10 00	4.8	14.5			330	367									
7+8	10 15	4.8	14.5			340	378									
10	10 20	20.3	.4			8										
1-5	11 10	6.6	13.0			320	401									
7+8	11 25	5.5	13.8			340	395									
9	11 40	—	—			—	—									Plugged up
1-5	1150	6.4	13.0			310	383									
1-5	1200	6.0	13.6					70	84.1	70	84.1	0	\			NOx Cal
—								72.5	87.1	72.5	87.1	0	\			Not same As NO
								75	90.1	75	90.1	0	-			only difference
								75	90.1	75	90.1	0	-			Accurate
1-5	12 10	6.5	12.8			320	398									Nox from
10	12 15	20.5	.4			12										Port 3
7+8	1220	4.8	14.5			350	389									
1-5	1245	5.6	13.9			330	386									
Stack																Line from Mill Wash
Blr Out 1	AVG.	5.9	13.5				385		87.85		87.85		0			
Blr Out 2	AVG.	5.0	14.3				387									
Fan Inlet	AVG.	20.4	.4				10									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
TEST NO. 16
DATE 1-8-79

FUEL Est. Kent
LOAD 100 K lbs
CONDITIONS As found (Acrossel)
DATA TAKEN BY JJB

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM(WET) NOx unc	NOx cor	NO unc	NO cor	NO2 unc	NO2 cor	HC unc	HC cor	Remarks
2-6	10:30	7.5	11.6	00s		235	314									Pretest
2,3,4,6	12:30	8.0	11.2	00s		270	375									1- SO_2 5- [illegible]
10	12:50	19.5	0.6	00s		5										paint filter down
7,8	13:10	4.3	14.8	00s		340	385									
7,8	13:35	5.2	13.7	00s		360	410									
2,3,4,6	14:06	8.2	11.2	00s		340	422									
10	14:25	19.8	0.6	00s		0										
7,8	15:35	5.3	13.4	00s		330	379									
3,4,6	17:00	9.5	10.0	00s		210	33[illegible]									
																Probe #4
																was out of
																the boiler
																during TC
																test and #5
																was in
corrected BLR OUT #1		4.1	14.7		-	338	360									
PAINT AIR	AVG	19.7	0.6		00s	3										
BLR OUT #1	AVG.	8.3	11.0		00s		360									
OUT #2	AVG.	4.9	14.0		00s		392									
STACK	AVG.	[illegible]														

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE F

TEST NO #17

DATE 1-10-71

FUEL [illegible]

LOAD [illegible]

CONDITIONS [illegible]

DATA TAKEN BY [illegible]

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM (WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	REMARKS
2,3,4,6	10[illegible]	[illegible].5	1.5			[illegible]	[illegible]									[illegible] #[illegible]
6	1125	5.4	[illegible]			[illegible]	[illegible]									Sat 124
7,8	1145	[illegible]	[illegible]			[illegible]	[illegible]									
2,3,5,6	1215	[illegible]	[illegible]			[illegible]	[illegible]									
10	1245	[illegible]	[illegible]			[illegible]	[illegible]									
2,3,5,6	13[illegible]	[illegible]	[illegible]			[illegible]	[illegible]									
78	1406	4.8	[illegible]			[illegible]	[illegible]									
6	1430	[illegible]	[illegible]			[illegible]	[illegible]									[illegible]
3,5,6	1500	[illegible]	[illegible]			[illegible]	[illegible]									
10	1520	[illegible]	[illegible]			[illegible]										
6	1530	[illegible]	[illegible]			[illegible]	[illegible]									[illegible]

AVERAGES

[illegible]	[illegible]	[illegible]	[illegible]		[illegible]		[illegible]									
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]		[illegible]									
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]		[illegible]									
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]		[illegible]									

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
TEST NO. 18
DATE Jan 12-79

FUEL Kentucky
LOAD 98%
CONDITIONS Varying Air
DATA TAKEN BY DJ

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM(WET) NOx unc	NOx cor	NO unc	NO cor	NO2 unc	NO2 cor	HC unc	HC cor	Remarks
2-5	10.45	8.4	11.2			250	358									low O2
2-5	11:00	9.0	10.6			280	421									Mid O2
2-5	11:30	9.8	10.0			270	435									High O2
2-5	12.00	9.3	10.0			280	428									
	AVG.															
	AVG.															
	AVG.															

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

KVB

GASEOUS EMISSIONS DATA

TEST SITE E
TEST NO. 20
DATE 1-18-79
RH = 40%

FUEL Kuwait
LOAD 100
CONDITIONS normal
DATA TAKEN BY MJ

Probe Position	Time	O_2 % (dry)	CO_2 % (dry)	CO ppm(dry) unc	CO ppm(dry) cor	NO ppm(dry) unc	NO ppm(dry) cor	HOT LINE SAMPLES, PPM(WET) NOx unc	NOx cor	NO unc	NO cor	NO_2 unc	NO_2 cor	HC unc	HC cor	Remarks
2-6	2:25	5.9	13.2			310	370									
6	2:40	2.4	15.9			390	377									
5	3:00	6.4	13.0			330	407									
4	3:22	10.0	9.8			260	411									
3	3:45	7.6	14.7			290	390									
2	4:00	9.0	11.0			300	451									
2-6	4:22	6.8	12.4			340	432									
2-6	5:22	8.0	11.2			290	402									
BLR OUT	AVG.	7.0	12.3		005		405									
	AVG.															
	AVG.															

NOTE: Parts per million (ppm) figures are corrected to 3% O_2

15900

Local S.L E

SOx DATA SHEET

Date 1-8-79 Probe Location & Probe Length 2'

Unit # 2 Fuel _____ Load _____

Test Description: _____

Test No.	Box No.	Sample Time	Meter Temp. (T)	Meter (p) Press.	Meter Reading	(P) Baro. Press.	Port	Purge Time	O2
16-1	1	12:48	115	-0-	0.000	29.28	2	40 min.	8.0
			120		1.001				
16-2	2	13:00	120		0.000			30 min.	8.0
			122		1.000				
16-3	Method #6	14:00	80		0.000			30 min	8.0
			84		1.000				

SAMPLED BY MT

Test # 16-1 Test # 16-2 Test # 16-3 Method #6

	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.0100						.0100		
Dilution Factor F	25	1		25	1		5	5	
Blank B								suspected Gross leak	
Averages									
Ml. of Titrant A	7.8	.9		7.6	.8		25	.4	
	7.7			7.6			25	1.4	
	7.8			7.6			25	—	
Averages	7.8	.9		7.6	.8		25	—	
460 + T	571.5	571.5		581	581		542		
Sample Vol. V	1.001	1.001		1.000			1.000		
P + p	29.28								
A - B	7.8	.9		7.6	.8				

TITRATED BY MS

$$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO2 = \frac{(7.8)(.0100)(25)(571.5)(24)}{(1.001)(29.28)}$$

SO2 = 922.1 SO3 = 4.6

$$SO3 = \frac{(.9)(.0100)(1)(571.5)(24)}{(1.001)(29.28)}$$

SO2 @ 3% O2 = 1279.5
SO3 @ 3% O2 = 6.3
SOx @ 3% O2 = 1285.8

$$SO2 = \frac{(7.6)(.0100)(25)(581)(24)}{(1.000)(29.28)}$$

SO2 = 905

$$SO3 = \frac{(.8)(.01)(1)(581)(24)}{(1)(29.28)}$$

SO3 = 3.8

SO2 @ 3% O2 = 1255.7
SO3 @ 3% O2 = 5.7
SOx @ 3% O2 = 1261

$$SO2 = \frac{(25)(.01)(5)(542)(24)}{(1.0)(29.28)}$$

SO2 = 555.3

$$SO3 = \frac{(4)(.01)(5)(542)(24)}{(1.0)(29.28)}$$

SO3 = 4.4

SO2 @ 3% O2 = 771
SO3 @ 3% O2 = 12
SOx @ 3% O2 = 783

6830-6 REV

Local Site E

SOx DATA SHEET

Date 1-10-79 Probe Location & Probe Length 2'

Unit # 2 Fuel _____ Load _____

Test Description: _____

Test No.	Box No.	Sample Time	Meter Temp. (T)	(p) Meter Press.	Meter Reading	(p) Baro. Press.	Port	Purge Time	O2
17A	Method #6	13:00	118	-0-	0.000	29.60	2	40 min	5.4
			118		1.000				
17B	1	13:50	118		0.000			45 min	4.7
			120		1.000				
17C	2	12:30	115		0.000			60 min	3.8
			115		1.000				

SAMPLED BY MJ

Method #6

Test # 17A Test # 17B Test # 17C

	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.0100	→	→	.0100	→	→			→
Dilution Factor F	5			25	1		25	1	
Blank B									
Averages									
Ml. of Titrant A	25.1	.1		5.65	.8		6.5	.9	
	25.3			5.7			—	—	
	25.3			5.7			—	—	
Averages	25.2	.1		5.7	.8		6.5	.9	
460 + T	578	578		57	57		575	575	
Sample Vol. V	1.000	→	→						→
P + p	29.60	→	→						→
A - B	25.2	.1		5.7	.8		6.5	.9	

TITRATED BY MJ

$$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$$

$$SO2 = \frac{(25.2)(.01)(5)(578)24}{(1.0)(29.6)}$$

SO2 = 590.5 SO3 = 2.3

$$SO3 = \frac{(.1)(.01)(5)(578)24}{(1.0)(29.6)}$$

SO2 @ 3% O2 = 682
SO3 @ 3% O2 = 2.7
SOx @ 3% O2 = 685

$$SO2 = \frac{(5.7)(.0100)(25)(579)24}{(1)(29.60)}$$

SO2 = 668

$$SO3 = \frac{(.8)(.0100)(1)(579)24}{(1)(29.60)}$$

SO3 = 3.7

SO2 @ 3% O2 = 738.0
SO3 @ 3% O2 = 4.0
SOx @ 3% O2 = 742.0

$$SO2 = \frac{(6.5)(.0100)(25)(575)24}{(1)(29.60)}$$

SO2 = 758

$$SO3 = \frac{(.9)(.0100)(1)(575)24}{(1)(29.60)}$$

SO3 = 4.0

SO2 @ 3% O2 = 793
SO3 @ 3% O2 = 4.2
SOx @ 3% O2 = 797.2

local Site E

SOx DATA SHEET

Date 1-10-79 Probe Location & Probe Length _____

Unit # 2 Fuel _____ Load _____

Test Description: _____

Test No.	Box No.	Sample Time	Meter Temp.(T)	Meter (P) Press.	Meter Reading	(p) Baro. Press.	Port	Purge Time	O2
17-4	METHOD #6	13:50	112	-0-	0.000	29.60	2	35	5.3
			—	-0-	1.000				

SAMPLED BY MJ

Test # 17-4 METHOD #6 Test # _____ Test # _____

	SO2	SO3	SOx	SO2	SO3	SOx	SO2	SO3	SOx
Normality N	.0160	→							
Dilution Factor F	5								
Blank B									
Averages									
Ml. of Titrant A	30.0	.2							
	30.3								
	30.2								
Averages	30.2								
460 + T	572	572							
Sample Vol. V	1.000	1.000							
P + p	29.60								
A - B	30.2	.2							

TITRATED BY MJ

$SO2 = \frac{(A-B)(N)(F)(460+T)(24)}{V(P+p)}$

$SO2 = \frac{(30.2)(.01)(5)(572)24}{(1.0)(29.6)}$

SO2 = 700 SO3 = 46

$SO3 = \frac{(.2)(.01)(5)(572)24}{(1.0)(29.6)}$

SO2 @ 3% O2 = 803
SO3 @ 3% O2 = 5.3
SOx @ 3% O2 = 808

$SO2 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$

SO2 = [ ]

$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$

SO3 = [ ]

SO2 @ 3% O2 = _____
SO3 @ 3% O2 = _____
SOx @ 3% O2 = _____

$SO2 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$

SO2 = [ ]

$SO3 = \frac{(\ )(\ )(\ )(\ )24}{(\ )(\ )}$

SO3 = [ ]

SO2 @ 3% O2 = _____
SO3 @ 3% O2 = _____
SOx @ 3% O2 = _____

SECTION 4.0

PARTICULATE SIZE DISTRIBUTION

		PAGE
4.1	BRINK	153
4.2	SASS	159

KVB

BRINK CASCADE IMPACTOR DATA REDUCTION

TEST NO. 11 | LOAD 93,400 lbs/hr

TEST SITE E | % O_2 7%

TEST DATE 12/18/79 | FUEL Kentucky (Industrial)

SAMPLE LOCATION Econ. Out | SPECIAL CONDITIONS Low O.F.A.

ρ_p - Density of particles 2.5 g/cm^3 | Vm - Dry gas volume 2.005 SCF

μ - Viscosity of flue gas 2.6 $\times 10^{-4}$ poise | Mn - Total particulate mass 68.5 mgm

MWs - Molecular wt. flue gas 29.4 g/g mole | Cn - Total concentration _____ grains/SCF

ΔP_I - Pressure drop across impactor 15.5 in H_2O | I - Percent isokinetics 90.2 %

Ps - Absolute stack pressure 28.92 in. Hg | Vs - Gas velocity 14.97 ft/sec.

Ts - Absolute stack temperature 960 °R | Dn - Nozzle diameter 0.119 in.

Qs - Actual flow rate at stack conditions .057 ft^3/min

Stage Number	CYCLONE	1	2	3	4	5	FINAL FILTER
Dj - Jet Diameter, cm		0.2490	0.1775	0.1396	0.0946	0.0731	
Fj - Press. factor, n.d.		0.0210	0.0273	0.0395	0.0903	0.3277	
$Ds_{,50}$ Stokes diameter, µm		3.29	1.90	1.27	0.62	0.36	
$D_{A,50}$ Aerodynamic diameter, µm		5.32	3.12	2.12	1.09	0.68	
$D_{AI,50}$ Aerodynamic impaction diameter, µm		5.53	3.33	2.32	1.29	0.87	
Mn - Particulate mass, mgm	53.8	11.0	2.6	1.9	2.2	0.2	0.8
% - Percent of Total	77.7	15.2	4.0	2.8	3.2	0.4	1.2
Cumulative percent	21.8	11.6	7.6	4.8	1.6	1.2	
Cn - Concentration, grains/SCF	0.414	0.054	0.020	0.015	0.017	0.002	0.006
Cumulative concentration, grains/SCF	0.414	0.468	0.488	0.503	0.520	0.522	0.528

#15900

KVB

BRINK CASCADE IMPACTOR DATA SHEET

TEST NO. 11 LOAD 52% 93,400 lbs/hr

TEST SITE E % O_2 7%

TEST DATE 12/18/78 FUEL Kentucky (Industrial)

SAMPLE LOCATION Econ. Out SPECIAL CONDITIONS Low O.F.A.

GAS VELOCITY DETERMINATION

PITOT TUBE ΔP 0.04 BAROMETRIC PRESS in. Hg, P_{bar} 29.22

GAS TEMP. °R, Ts 960 GAS STATIC PRESS in. H_2O -4.1

PITOT CORRECTION FACTOR, Cp GAS STATIC PRESS in. Hg abs, Ps 28.92

MOLECULAR WT. FLUE GAS, MWs 29.4

$$Vs = 85.48\ Cp\ \left(\frac{Ts\ \Delta P}{Ps\ MWs}\right)^{\frac{1}{2}} = 14.97 \text{ ft/sec}$$

IMPACTOR FLOW RATE DETERMINATION

NOZZLE DIAMETER inches, Dn 0.119

NOZZLE AREA ft^2, An 7.72×10^{-5} $An = \pi(Dn/24)^2$

$Qn = Vs\ An\ 60 = 0.069$ ft^3/min at nozzle

$Qc = Qs\ \left(\frac{Ps MWs}{1.3 Ts}\right)^{\frac{1}{2}} = 0.0569$ ft^3/min corrected to calibration conditions

PRESSURE DROP ACROSS IMPACTOR FROM CALIBRATION CURVE 15.5 in. H_2O

OPERATING VACUUM (corrected for static pressure of duct) 19.6 in. H_2O

ISOKINETICS DETERMINATION

	SAMPLE TIME (θ)	METER READING (Vm)	METER TEMP (Tm)
INITIAL	2.40pm	0.000	94
FINAL	3.39.5sec	2.005	92
Δ	59.9	2.005	93

$\%H_2O$ = 6.5 %

$$I = \frac{1.667\ Ts\ Vm\ P_{bar}}{\theta\ Tm\ Vs\ Ps\ An\left(1-\frac{\%H_2O}{100}\right)} = 90.2\ \%$$

#15900

KVB

BRINK CASCADE IMPACTOR LAB WORKSHEET

TEST No. 11 LOCATION 5.k E

TEST DATE 12-19-78 ENGINEER

TEST DESCRIPTION

PRE TEST WEIGHTS (GRAMS)

PLATE NO.		CYCLONE	1	2	3	4	5	FINAL FILTER
DATE WT.		12-20-78	12-18-78	—	—	—	—	→
TARE WT.	1	.3979	3.5117	3.0939	3.9825	3.7817	3.9024	.0466
	2	—	3.5116	3.0940	3.9825	3.7818	3.9025	.0467
	3	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—
AVERAGE		.3979	3.5117	3.0940	3.9825	3.7818	3.9025	.0467

POST TEST WEIGHTS (GRAMS)

DATE WT.		12-20-78	—	—	—	—	—	—
GROSS WT.	1	.4517	3.5187	3.0965	3.9844	3.7840	3.9027	.0475
	2	—	3.5186	3.0966	3.9844	3.7838	3.9027	.0475
	3	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—
AVERAGE		.4517	3.5187	3.0966	3.9844	3.7840	3.9027	.0475

NET TEST RESULTS (MILLIGRAMS)

NET WT.	.0538 g	.0070 g	.0026 g	.0019 g	.0022 g	.0002 g	.0008 g
PERCENT	79.1	10.2	4.0	2.8	3.2	0.4	1.2

TOTAL NET WEIGHT 68.50 mgm

#15900

KVB

BRINK CASCADE IMPACTOR DATA REDUCTION

TEST NO. 14 — LOAD 110 Klbs/hr

TEST SITE E — % O_2 3.9 %

TEST DATE 12/21/78 — FUEL Crushed

SAMPLE LOCATION Econ. Out — SPECIAL CONDITIONS normal

ρ_p - Density of particles 2.5 g/cm^3 — Vm - Dry gas volume 2.00 SCF

μ - Viscosity of flue gas 2.63 $\times 10^{-4}$ poise — Mn - Total particulate mass 216.6 mgm

MWs - Molecular wt. flue gas 29.4 g/g mole — Cn - Total concentration 1.672 grains/SCF

ΔP_I - Pressure drop across impactor 7.5 in H_2O — I - Percent isokinetics 101 %

Ps - Absolute stack pressure 28.07 in. Hg — Vs - Gas velocity 24.402 ft/sec.

Ts - Absolute stack temperature 960 °R — Dn - Nozzle diameter 0.077 in.

Qs - Actual flow rate at stack conditions 0.039 ft^3/min

Stage Number	CYCLONE	1	2	3	4	5	FINAL FILTER
Dj - Jet Diameter, cm		0.2490	0.1775	0.1396	0.0946	0.0731	
Fj - Press. factor, n.d.		0.0210	0.0273	0.0395	0.0903	0.3279	
$D_{s,\overline{50}}$ Stokes diameter, µm		4.04	2.35	1.58	0.79	0.47	
$D_{A,\overline{50}}$ Aerodynamic diameter, µm		6.51	3.83	2.61	1.37	0.86	
$D_{AI,\overline{50}}$ Aerodynamic impaction diameter, µm		6.72	4.05	2.82	1.57	1.07	
Mn - Particulate mass, mgm	198.8	5.0	5.7	2.4	0.6	0.7	3.4
% - Percent of Total	92.9	2.3	2.6	1.1	0.3	0.3	1.6
Cumulative percent	8.2	5.9	3.3	2.2	1.9	1.6	
Cn - Concentration, grains/SCF	1.53	0.04	0.04	0.02	0.00	0.01	0.03
Cumulative concentration, grains/SCF	1.53	1.57	1.61	1.63	1.63	1.64	1.66

#15900

KVB

BRINK CASCADE IMPACTOR DATA SHEET

TEST NO. 14 LOAD 110 Klbs/hr

TEST SITE E % O_2 3.9 %

TEST DATE 12/21/78 FUEL Crushed

SAMPLE LOCATION Econ. Out SPECIAL CONDITIONS normal

GAS VELOCITY DETERMINATION

PITOT TUBE ΔP 0.1 BAROMETRIC PRESS in. Hg, P_{bar} 28.38

GAS TEMP. °R, Ts 960 GAS STATIC PRESS in. H_2O −4.2

PITOT CORRECTION FACTOR, Cp 0.837 GAS STATIC PRESS in. Hg abs, Ps 28.07

MOLECULAR WT. FLUE GAS, MW_s 29.4

$$Vs = 85.48\ Cp\ \left(\frac{Ts\ \Delta P}{Ps\ MWs}\right)^{\frac{1}{2}} = 24.402 \text{ ft/sec}$$

IMPACTOR FLOW RATE DETERMINATION

NOZZLE DIAMETER inches, Dn 0.077

NOZZLE AREA ft^2, An 3.234×10^{-5} $An = \pi(Dn/24)^2$

$Qn = Vs\ An\ 60 = 0.0473$ ft^3/min at nozzle

$Qc = Qs\ \left(\frac{PsMWs}{1.3Ts}\right)^{\frac{1}{2}} = 0.0384$ ft^3/min corrected to calibration conditions

PRESSURE DROP ACROSS IMPACTOR FROM CALIBRATION CURVE 2.5 in. H_2O

OPERATING VACUUM (corrected for static pressure of duct) 11.7 in. H_2O

ISOKINETICS DETERMINATION

	SAMPLE TIME (θ)	METER READING (Vm)	METER TEMP (Tm)
INITIAL	10:00	0.00	163
FINAL	11:17	2.00	104
Δ	77.	2.00	100

$\%H_2O$ = 6.5 %

$$I = \frac{1.667\ Ts\ Vm\ P_{bar}}{\theta\ Tm\ Vs\ Ps\ An\left(1-\frac{\%H_2O}{100}\right)} = 100.98\ \%$$

#15900

KVB

BRINK CASCADE IMPACTOR LAB WORKSHEET

TEST No. 14 LOCATION Side E

TEST DATE 12-21-78 ENGINEER

TEST DESCRIPTION

PRE TEST WEIGHTS (GRAMS)

PLATE NO.		CYCLONE	1	2	3	4	5	FINAL FILTER
DATE WT.		12-20-78	—	—	—	—	—	—
TARE WT.	1	.3911	3.5116	3.0934	3.9823	3.7813	3.9017	.0372
	2	—	3.5116	3.0934	3.9822	3.7813	3.9017	.0372
	3	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—
AVERAGE		.3911	3.5116	3.0934	3.9822	3.7813	3.9017	.0372

POST TEST WEIGHTS (GRAMS)

DATE WT.					3			
GROSS WT.	1	.5899	3.5166	3.0993	3.9847	3.7820	3.9024	.0406
	2	—	3.5167	3.0990	3.9846	3.7819	3.9024	.0407
	3	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—
AVERAGE		.5899	3.5166	3.0991	3.9846	3.7819	3.9024	.0406

NET TEST RESULTS (grams)

NET WT.	0.1988	.0050	.0057	.0024	.0006	.0007	.0034
PERCENT	92.9	2.3	2.6	1.1	0.28	0.3	1.6

TOTAL NET WEIGHT 216.6 mgm

#15900

SITE E

SASS GRAVIMETRICS

Test 16	10μ	45.4120	26.75% Passing
	3μ	9.9770	10.66% Passing
	1μ	5.5753	1.67% Passing
	Filter	1.0323	
	Total	61.9966	

Test 17	10μ	38.6439	23.33% Passing
	3μ	7.1962	9.05% Passing
	1μ	3.8166	1.48% Passing
	Filter	0.7436	
	Total	50.4003	

SECTION 5.0

FUEL AND ASH ANALYSIS

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5.2	COMBUSTIBLES ANALYSES	223
5.3	COAL SIEVE ANALYSES	225

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COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

March 7, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Kentucky Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	----
Date received	2/23/79

Test #2
Test Site: E

Analysis report no. 71- 28210

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	4.63	xxxxx
% Ash	5.89	6.18
% Volatile	36.78	38.56
% Fixed Carbon	52.70	55.26
	100.00	100.00
Btu/lb.	13651	14314
% Sulfur	0.86	0.90

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	4.63	xxxxx
% Carbon	74.94	78.58
% Hydrogen	4.99	5.23
% Nitrogen	1.51	1.58
% Chlorine	0.20	0.21
% Sulfur	0.86	0.90
% Ash	5.89	6.18
% Oxygen(diff)	6.98	7.32
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

RAH/ br

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16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 6, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	11/18/78
Date received	2/23/79

Test #3

Analysis report no. 71- 28214

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	6.52	xxxxx
% Ash	8.68	9.29
% Volatile	34.51	36.92
% Fixed Carbon	50.29	53.79
	100.00	100.00
Btu/lb.	12546	13421
% Sulfur	0.96	1.03

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	6.52	xxxxx
% Carbon	70.87	75.81
% Hydrogen	4.75	5.08
% Nitrogen	1.29	1.38
% Chlorine	0.17	0.18
% Sulfur	0.96	1.03
% Ash	8.68	9.29
% Oxygen(diff)	6.76	7.23
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Kentucky Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	----
Date received	2/23/79

Test #4
Test Site: E

Analysis report no. 71- 28218

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	5.77	xxxxx
% Ash	6.71	7.12
% Volatile	35.44	37.61
% Fixed Carbon	52.08	55.27
	100.00	100.00
Btu/lb.	12942	13734
% Sulfur	0.74	0.79

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	5.77	xxxxx
% Carbon	72.97	77.44
% Hydrogen	4.89	5.19
% Nitrogen	1.47	1.56
% Chlorine	0.09	0.10
% Sulfur	0.74	0.79
% Ash	6.71	7.12
% Oxygen(diff)	7.36	7.80
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us: Kentucky Coal

Test No. 5
Test Site: E

Sample taken at: ----

Sample taken by: KVB, Inc.

Date sampled: 11/21/78

Date received: 2/23/79

Analysis report no. 71- 28222

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	8.13	xxxxx
% Ash	10.24	11.15
% Volatile	33.03	35.95
% Fixed Carbon	48.60	52.90
	100.00	100.00
Btu/lb.	12021	13085
% Sulfur	0.85	0.93

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	8.13	xxxxx
% Carbon	67.74	73.74
% Hydrogen	4.59	5.00
% Nitrogen	1.31	1.43
% Chlorine	0.14	0.15
% Sulfur	0.85	0.93
% Ash	10.24	11.15
% Oxygen(diff)	7.00	7.60
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 5, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Kent Coal Industrial
Sample taken at	-----
Sample taken by	KVB, Inc.
Date sampled	12-12-78
Date received	2-23-79

Test #6
Test Site: E

P.O. #323-15900

Analysis report no. 71- 28226

PROXIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	6.70	xxxxx
% Ash	9.71	10.41
% Volatile	32.53	34.87
% Fixed Carbon	51.06	54.72
	100.00	100.00
Btu/lb.	12417	13309
% Sulfur	0.85	0.91

ULTIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	6.70	xxxxx
% Carbon	70.15	75.19
% Hydrogen	4.60	4.93
% Nitrogen	1.25	1.34
% Chlorine	0.12	0.13
% Sulfur	0.85	0.91
% Ash	9.71	10.41
% Oxygen(diff)	6.62	7.09
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 5, 1979

Sample identification by

KVB, Inc.

Kind of sample reported to us	Kent Coal Industrial
Sample taken at	-----
Sample taken by	KVB, Inc.
Date sampled	12/14/78
Date received	2-23-79

Test #7
Test Site: E

P.O. #323-15900

Analysis report no. 71- 28230

PROXIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	4.81	xxxxx
% Ash	9.89	10.39
% Volatile	32.97	34.64
% Fixed Carbon	52.33	54.97
	100.00	100.00
Btu/lb.	12957	13612
% Sulfur	1.01	1.06

ULTIMATE ANALYSIS

	As Rec'd	Dry Basis
% Moisture	4.81	xxxxx
% Carbon	72.43	76.09
% Hydrogen	4.67	4.91
% Nitrogen	0.94	0.99
% Chlorine	0.10	0.11
% Sulfur	1.01	1.06
% Ash	9.89	10.39
% Oxygen(diff)	6.15	6.45
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.,

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 6, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Kentucky Industrial Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	12/15/78
Date received	2/23/79

Test No. 8
Test Site: E

Analysis report no. 71- 28234

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	4.65	xxxxx
% Ash	5.80	6.08
% Volatile	47.67	50.00
% Fixed Carbon	41.88	43.92
	100.00	100.00
Btu/lb.	13519	14178
% Sulfur	0.73	0.77

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	4.65	xxxxx
% Carbon	75.98	79.69
% Hydrogen	5.01	5.25
% Nitrogen	1.20	1.26
% Chlorine	0.15	0.16
% Sulfur	0.73	0.77
% Ash	5.80	6.08
% Oxygen(diff)	6.48	6.79
	100.00	100.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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Charter Member

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GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Kentucky Industrial Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	12/16/78
Date received	2/23/79

Test No. 9
Test Site: E

Analysis report no. 71- 28238

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	5.27	xxxxx
% Ash	10.25	10.82
% Volatile	32.77	34.59
% Fixed Carbon	51.71	54.59
	100.00	100.00
Btu/lb.	12666	13371
% Sulfur	0.77	0.81

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	5.27	xxxxx
% Carbon	71.53	75.51
% Hydrogen	4.58	4.83
% Nitrogen	1.44	1.52
% Chlorine	0.09	0.09
% Sulfur	0.77	0.81
% Ash	10.25	10.82
% Oxygen(diff)	6.07	6.42
	100.00	100.00

Respectfully submitted,
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16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

Sample identification by KVB

Kind of sample reported to us: Kent Industrial Coal

Test No. 11
Test Site: E

Sample taken at: -----

Sample taken by: KVB

Date sampled: 12/18/78

Date received: 2/23/79

Analysis report no. 71- 28242

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	5.23	xxxxx
% Ash	10.19	10.75
% Volatile	33.73	35.59
% Fixed Carbon	50.85	53.66
	100.00	100.00
Btu/lb.	12790	13495
% Sulfur	0.89	0.94

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	5.23	xxxxx
% Carbon	71.43	75.37
% Hydrogen	4.70	4.96
% Nitrogen	1.49	1.57
% Chlorine	0.17	0.18
% Sulfur	0.89	0.94
% Ash	10.19	10.75
% Oxygen(diff)	5.90	6.23
	100.00	100.00

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16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

KVB, Inc.

Kind of sample reported to us	Crushed Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	12/20/78
Date received	2/23/79

Test No. 12
Test Site: E

Analysis report no. 71- 28246

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	6.09	xxxxx
% Ash	8.76	9.33
% Volatile	33.00	35.14
% Fixed Carbon	52.15	55.53
	100.00	100.00
Btu/lb.	12793	13623
% Sulfur	0.78	0.83

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	6.09	xxxxx
% Carbon	71.65	76.30
% Hydrogen	4.72	5.03
% Nitrogen	1.44	1.53
% Chlorine	0.21	0.22
% Sulfur	0.78	0.83
% Ash	8.76	9.33
% Oxygen(diff)	6.35	6.76
	100.00	100.00

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us: Crushed Coal

Test No. 13
Test Site: E

Sample taken at: ----

Sample taken by: KVB, Inc.

Date sampled: 12/20/78

Date received: 2/23/79

Analysis report no. 71- 28250

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	5.93	xxxxx
% Ash	10.35	11.00
% Volatile	33.38	35.49
% Fixed Carbon	50.34	53.51
	100.00	100.00
Btu/lb.	12565	13358
% Sulfur	0.68	0.72

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	5.93	xxxxx
% Carbon	70.56	75.01
% Hydrogen	4.61	4.90
% Nitrogen	1.31	1.39
% Chlorine	0.14	0.15
% Sulfur	0.68	0.72
% Ash	10.35	11.00
% Oxygen(diff)	6.42	6.83
	100.00	100.00

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Crushed Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	12/20/78
Date received	2/23/79

Test No. 14
Test Site: E

Analysis report no. 71- 28252

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	5.04	xxxxx
% Ash	8.13	8.56
% Volatile	34.12	35.93
% Fixed Carbon	52.71	55.51
	100.00	100.00
Btu/lb.	13135	13832
% Sulfur	0.67	0.71

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	5.04	xxxxx
% Carbon	73.64	77.55
% Hydrogen	4.82	5.08
% Nitrogen	1.32	1.39
% Chlorine	0.08	0.08
% Sulfur	0.67	0.71
% Ash	8.13	8.56
% Oxygen(diff)	6.30	6.63
	100.00	100.00

Respectfully submitted,
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16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

KVB, Inc.

Kind of sample reported to us: Eastern Kentucky Coal

Test No. 15
Test Site: E

Sample taken at: ----

Sample taken by: KVB, Inc.

Date sampled: 1/5/79

Date received: 2/23/79

Analysis report no. 71- 28253

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	5.04	xxxxx
% Ash	8.41	8.86
% Volatile	34.92	36.77
% Fixed Carbon	51.63	54.37
	100.00	100.00
Btu/lb.	12958	13646
% Sulfur	0.81	0.85

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	5.04	xxxxx
% Carbon	72.59	76.45
% Hydrogen	4.80	5.06
% Nitrogen	1.39	1.46
% Chlorine	0.09	0.10
% Sulfur	0.81	0.85
% Ash	8.41	8.86
% Oxygen(diff)	6.87	7.22
	100.00	100.00

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 5, 1979

Sample certified by KVB, Inc.

Kind of sample reported to us	Eastern Kent Coal	Test #16 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	1/8/79	
Date received	2-23-79	P.O. #323-15900

Analysis report no 71- 28257

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	7.57	xxxxx
% Ash	8.01	8.67
% Volatile	34.02	36.81
% Fixed Carbon	50.40	54.52
	100.00	100.00
Btu/lb.	12486	13508
% Sulfur	0.74	0.80

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	7.57	xxxxx
% Carbon	70.02	75.75
% Hydrogen	4.60	4.98
% Nitrogen	0.86	0.93
% Chlorine	0.07	0.08
% Sulfur	0.74	0.80
% Ash	8.01	8.67
% Oxygen(diff)	8.13	8.79
	100.00	100.00

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 6, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Kentucky Coal
Sample taken at	----
Sample taken by	KVB, Inc.
Date sampled	1/10/79
Date received	2/23/79

Test No. 17
Test Site: E

Analysis report no. 71- 28261

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	7.11	xxxxx
% Ash	8.07	8.69
% Volatile	33.81	36.40
% Fixed Carbon	51.01	54.91
	100.00	100.00
Btu/lb.	12530	13489
% Sulfur	0.82	0.88

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	7.11	xxxxx
% Carbon	70.66	76.07
% Hydrogen	4.65	5.01
% Nitrogen	1.19	1.28
% Chlorine	0.08	0.09
% Sulfur	0.82	0.88
% Ash	8.07	8.69
% Oxygen(diff)	7.42	7.98
	100.00	100.00

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16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

March 6, 1979

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

Sample identification by KVB, Inc.

Kind of sample reported to us: Kentucky Coal

Test No. 20
Test Site: E

Sample taken at: ----

Sample taken by: KVB, Inc.

Date sampled: 1/19/79

Date received: 2/23/79

Analysis report no. 71- 28265

PROXIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	8.61	xxxxx
% Ash	8.33	9.11
% Volatile	32.38	35.43
% Fixed Carbon	50.68	55.46
	100.00	100.00
Btu/lb.	12460	13634
% Sulfur	0.99	1.08

ULTIMATE ANALYSIS	As Rec'd	Dry Basis
% Moisture	8.61	xxxxx
% Carbon	69.89	76.48
% Hydrogen	4.58	5.01
% Nitrogen	1.19	1.30
% Chlorine	0.08	0.09
% Sulfur	0.99	1.08
% Ash	8.33	9.11
% Oxygen(diff)	6.33	6.93
	100.00	100.00

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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

Kind of sample reported to us: Eastern Kentucky Coal

Sample identification by KVB, Inc.

Sample taken at: -----

Test No. Composite
Test Site: E

Sample taken by: KVB, Inc.

Date sampled: -----

Date received: 2/23/79

Analysis report no. 71- 28271

PROXIMATE ANALYSIS	As received	Dry basis
% Moisture	2.44	xxxxx
% Ash	8.26	8.47
% Volatile	36.17	37.07
% Fixed Carbon	53.13	54.46
	100.00	100.00
Btu/lb.	13224	13555
% Sulfur	0.77	0.79
% Alk. as Na_2O	xxxxx	0.14

SULFUR FORMS		
% Pyritic Sulfur	0.15	0.15
% Sulfate Sulfur	0.01	0.01
% Organic Sulfur	0.61	0.63

WATER SOLUBLE ALKALIES		
% Na_2O =	xxxxx	xxxx
% K_2O =	xxxxx	xxxx

FUSION TEMPERATURE OF ASH	Reducing	Oxidizing
Initial Deformation	2700+ °F	°F
Softening (H = W)	2700+ °F	°F
Softening (H = ½W)	2700+ °F	°F
Fluid	2700+ °F	°F

% EQUILIBRIUM MOISTURE =	xxxx
HARDGROVE GRINDABILITY INDEX =	37
FREE SWELLING INDEX =	4 1/2

*These ignited basis results were used to calculate undetermined value above

%Strontium oxide, SrO	0.08
%Barium oxide, BaO	0.11
%Manganese oxide, Mn_3O_4	0.01

ULTIMATE ANALYSIS	% Weight As received	% Weight Dry basis
Moisture	2.44	xxxxx
Carbon	74.26	76.12
Hydrogen	4.90	5.02
Nitrogen	1.35	1.38
Chlorine	0.09	0.09
Sulfur	0.77	0.79
Ash	8.26	8.47
Oxygen (diff)	7.93	8.13
	100.00	100.00

MINERAL ANALYSIS OF ASH	% Weight Ignited Basis
Silica, SiO_2	49.80
Alumina, Al_2O_3	36.27
Titania, TiO_2	1.63
Ferric oxide, Fe_2O_3	5.19
Lime, CaO	2.07
Magnesia, MgO	0.88
Potassium oxide, K_2O	2.07
Sodium oxide, Na_2O	0.25
Sulfur trioxide, SO_3	1.15
Phos. pentoxide, P_2O_5	0.43
Undetermined	0.06
	100.00
SILICA VALUE =	85.95
BASE: ACID RATIO	0.12
T_{250} Temperature =	2900+°F

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

Charter Member

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

March 8, 1979

Kind of sample reported to us: Crushed

Sample identification by KVB, INC.

Sample taken at: ----

Test No. Crushed Composite
Test Site: E

Sample taken by: KVB, INC.

Date sampled: 12/20/78

Date received: 2/23/79

Analysis report no. 71- 28270

PROXIMATE ANALYSIS	As received	Dry basis
% Moisture	2.49	xxxxx
% Ash	8.10	8.31
% Volatile	35.05	35.95
% Fixed Carbon	54.36	55.74
	100.00	100.00
Btu/lb.	13508	13853
% Sulfur	0.76	0.78
% Alk. as Na_2O	xxxxx	0.17

SULFUR FORMS		
% Pyritic Sulfur	0.08	0.08
% Sulfate Sulfur	0.00	0.00
% Organic Sulfur	0.68	0.70

WATER SOLUBLE ALKALIES		
% Na_2O =	----	----
% K_2O =	----	----

FUSION TEMPERATURE OF ASH	Reducing	Oxidizing
Initial Deformation	2700+ °F	---- °F
H is Cone Height — Softening (H = W)	2700+ °F	---- °F
W is Cone Width — Softening (H = ½W)	2700+ °F	---- °F
Fluid	2700+ °F	---- °F

% EQUILIBRIUM MOISTURE =	----
HARDGROVE GRINDABILITY INDEX =	41
FREE SWELLING INDEX =	6 1/2

ULTIMATE ANALYSIS	As received	Dry basis
Moisture	2.49	xxxxx
Carbon	75.79	77.73
Hydrogen	5.02	5.15
Nitrogen	1.00	1.03
Chlorine	0.14	0.14
Sulfur	0.76	0.78
Ash	8.10	8.31
Oxygen (diff)	6.70	6.86
	100.00	100.00

MINERAL ANALYSIS OF ASH	% Weight Ignited Basis
Silica, SiO_2	52.03
Alumina, Al_2O_3	33.59
Titania, TiO_2	1.66
Ferric oxide, Fe_2O_3	5.34
Lime, CaO	1.95
Magnesia, MgO	1.08
Potassium oxide, K_2O	2.56
Sodium oxide, Na_2O	0.32
Sulfur trioxide, SO_3	0.76
Phos. pentoxide, P_2O_5	0.49
Undetermined	0.06*
	100.00
SILICA VALUE =	86.14
BASE: ACID RATIO	0.13
T_{250} Temperature =	2890 °F

*These ignited basis results were used to calculate undetermined value above

%Strontium oxide, SrO	0.00
%Barium oxide, BaO	0.13
%Manganese oxide, Mn_3O_4	0.03

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

March 8, 1979

Kind of sample reported to us: Kent Coal

Sample identification by KVB, INC.

Sample taken at: ----

Test No. Composite
Test Site: E

Sample taken by: KVB, INC.

Date sampled: 1/19/79

Date received: 2/23/79

Analysis report no. 71- 28269

PROXIMATE ANALYSIS	As received	Dry basis
% Moisture	2.03	xxxxx
% Ash	10.35	10.56
% Volatile	34.12	34.83
% Fixed Carbon	53.50	54.61
	100.00	100.00
Btu/lb.	13193	13466
% Sulfur	0.95	0.97
% Alk. as Na_2O	xxxxx	0.16
SULFUR FORMS		
% Pyritic Sulfur	0.18	0.18
% Sulfate Sulfur	0.00	0.00
% Organic Sulfur	0.77	0.79
WATER SOLUBLE ALKALIES		
% Na_2O =	----	----
% K_2O =	----	----

FUSION TEMPERATURE OF ASH	Reducing	Oxidizing
Initial Deformation	2700+ °F	---- °F
H is Cone Height — Softening (H = W)	2700+ °F	---- °F
W is Cone Width — Softening (H = ½W)	2700+ °F	---- °F
Fluid	2700+ °F	---- °F

% EQUILIBRIUM MOISTURE =	----
HARDGROVE GRINDABILITY INDEX =	47
FREE SWELLING INDEX =	7 1/2

ULTIMATE ANALYSIS	As received	Dry basis
Moisture	2.03	xxxxx
Carbon	74.33	75.87
Hydrogen	4.78	4.88
Nitrogen	0.92	0.94
Chlorine	0.11	0.11
Sulfur	0.95	0.97
Ash	10.35	10.56
Oxygen (diff)	6.53	6.67
	100.00	100.00

MINERAL ANALYSIS OF ASH	% Weight Ignited Bas
Silica, SiO_2	52.67
Alumina, Al_2O_3	31.68
Titania, TiO_2	3.71
Ferric oxide, Fe_2O_3	6.22
Lime, CaO	1.64
Magnesia, MgO	0.77
Potassium oxide, K_2O	1.88
Sodium oxide, Na_2O	0.26
Sulfur trioxide, SO_3	0.81
Phos. pentoxide, P_2O_5	0.18
Undetermined	0.03*
	100.00
SILICA VALUE =	85.92
BASE: ACID RATIO	0.12
T_{250} Temperature =	2900+°F

*These ignited basis results were used to calculate undetermined value above

%Strontium oxide, SrO 0.00
%Barium oxide, BaO 0.14
%Manganese oxide, Mn_3O_4 ..... 0.01

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Bottom Ash
Sample taken at	-----
Sample taken by	KVB, Inc.
Date sampled	-----
Date received	2/23/79

Test#2
Test Site: E

P/O# 323-15900

Analysis report no. 71- 28211

	Dry Basis
%Ash.....	92.00
%Combustible.....	8.00

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Economizer Ash	Test#2 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	-----	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28213

	Dry Basis
%Ash.....	47.29
%Combustible.....	52.71

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 6, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Multi-clone Ash
Sample taken at	-----
Sample taken by	KVB, Inc.
Date sampled	----
Date received	2/23/79

Test No. 2
Test Site: E

Analysis report no. 71- 28212

	Dry Basis
%Ash	49.15
%Combustible	50.85

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 2, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Economizer Collector	Test #3,
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	11/18/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28217

	Dry Basis
%Ash	34.75
%Combustible	65.25

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Dust Collector Ash	Test#3 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	11/18/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28216

	Dry Basis
%Ash.....	44.53
%Combustible.....	55.47

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#3 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	-----	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28215

	Dry Basis
%Ash.....	94.32
%Combustible.....	5.68

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Bottom Ash Sample	Test#4 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	11/20/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28219

	Dry Basis
%Ash.....	91.76
%Combustible.....	8.24

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Dust Collector Ash	Test#4 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	11/20/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28220

	Dry Basis
%Ash.....	57.74
%Combustible.....	42.26

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Economizer Ash	Test#4 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	11/20/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28221

	Dry Basis
%Ash.....	58.42
%Combustible.....	41.58

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, MN 55422

March 9, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Economizer
Sample taken at	----
Sample taken by	KVB, INC.
Date sampled	11/21/78
Date received	2/23/79

Test #5
Test Site: E

Analysis report no. 71- 28225

	Dry Basis
%Ash	55.86
%Combustible	44.14

Respectfully submitted,
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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#5 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	11/21/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28223

	Dry Basis
%Ash.....	93.25
%Combustible.....	6.75

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Dust Collector Ash	Test#5 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	11/21/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28224

	Dry Basis
%Ash.....	61.74
%Combustible.....	38.26

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OFFICE TEL. (312) 284-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#6 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/12/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28227

	Dry Basis
%Ash.....	89.49
%Combustible.....	10.51

Respectfully submitted,
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16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Economizer Ash	Test#6 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/12/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28229

	Dry Basis
%Ash.....	52.30
%Combustible.....	47.70

Respectfully submitted,
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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Dust Collector Ash	Test#6 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/12/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28228

	Dry Basis
%Ash.....	42.17
%Combustible.....	57.83

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Bottom	Test#7 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/14/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28231

	Dry Basis
%Ash.....	89.90
%Combustible.....	10.10

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Dust Collector Ash	Test#7 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/14/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28232

	Dry Basis
%Ash.....	57.02
%Combustible.....	42.98

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Economizer Ash	Test#7 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/14/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28233

	Dry Basis
%Ash.....	55.66
%Combustible.....	44.34

Respectfully submitted,
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R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#8 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/15/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28235

	Dry Basis
%Ash.....	93.03
%Combustible.....	6.97

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Dust Collector Ash
Sample taken at	-----
Sample taken by	KVB, Inc.
Date sampled	12/15/78
Date received	2/23/79

Test#8
Test Site: E

P/O# 323-15900

Analysis report no. 71- 28236

	Dry Basis
%Ash	57.30
%Combustible	42.70

Respectfully submitted,
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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Hopper Ash	Test#8 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/15/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28237

	Dry Basis
%Ash.....	52.04
%Combustible.....	47.96

Respectfully submitted,
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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#9 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/16/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28239

	Dry Basis
%Ash.....	83.07
%Combustible.....	16.93

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Dust Collector Ash	Test#9 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/16/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28240

	Dry Basis
%Ash.....	51.41
%Combustible.....	48.59

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Economizer Hopper Ash	Test#9 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/16/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28241

	Dry Basis
%Ash.....	69.05
%Combustible.....	30.95

Respectfully submitted,
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203 R. A. HOUSER, Manager, Midwest Division

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OFFICE TEL. (312) 264-1173

March 2, 1979

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

Sample identification by KVB, INC.

Kind of sample reported to us	Bottom Ash
Sample taken at	-----
Sample taken by	KVB, Inc.
Date sampled	12/18/78
Date received	2/23/79

Test#11
Test Site: E

P/O# 323-15900

Analysis report no. 71- 28243

	Dry Basis
%Ash.....	84.16
%Combustible.....	15.84

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

R. A. HOUSER, Manager, Midwest Division

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GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD., SOUTH HOLLAND, IL 60473
OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Dust Collector Ash	Test#11 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/18/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28244

	Dry Basis
%Ash.....	65.79
%Combustible.....	34.21

Respectfully submitted,
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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Economizer Ash	Test#11 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/18/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28245

	Dry Basis
%Ash.....	48.23
%Combustible.....	51.77

Respectfully submitted,
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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#12 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/20/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28247

	Dry Basis
%Ash.....	88.47
%Combustible.....	11.53

Respectfully submitted,
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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 2, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Dust Collector Ash	Test #12, 13 & 14 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/20/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28248

	Dry Basis
%Ash	46.14
%Combustible	53.86

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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OFFICE TEL. (312) 264-1173

KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422

March 2, 1979

Sample identification by KVB, Inc.

Kind of sample reported to us	Economizer Hopper Ash	Test #12, 13 & 14 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/20/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28249

	Dry Basis
%Ash	46.02
%Combustible	53.98

Respectfully submitted,
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R. A. HOUSER, Manager, Midwest Division

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#13 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	12/20/78	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28251

	Dry Basis
%Ash	92.30
%Combustible	7.70

Respectfully submitted,
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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#15 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	1/5/79	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28254

	Dry Basis
%Ash.....	87.37
%Combustible.....	12.63

Respectfully submitted,
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Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Dust Collector Ash	Test#15 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	1/5/79	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28255

	Dry Basis
%Ash.....	42.85
%Combustible.....	57.15

Respectfully submitted,
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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Economizer Hopper Ash	Test#15 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	1/5/79	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28256

	Dry Basis
%Ash.....	28.80
%Combustible.....	71.20

Respectfully submitted,
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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#16 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	1/8/79	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28258

	Dry Basis
%Ash	89.54
%Combustible	10.46
%Sulfur	0.08

Respectfully submitted,
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KVB, INC.
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6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Dust Collector Ash
Sample taken at	-----
Sample taken by	KVB, Inc.
Date sampled	1/8/79
Date received	2/23/79

Test#16
Test Site: E

P/O# 323-15900

Analysis report no. 71- 28259

	Dry Basis
%Ash	43.05
%Combustible	56.95
%Sulfur	0.39

Respectfully submitted,
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6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Economizer Ash	Test#16 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	1/8/79	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28260

	Dry Basis
%Ash	52.11
%Combustible	47.89
%Sulfur	1.00

Respectfully submitted,
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A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#17 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	1/10/79	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28262

	Dry Basis
%Ash	93.61
%Combustible	6.39
%Sulfur	0.11

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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Dust Collector Ash	Test#17 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	1/10/79	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28263

	Dry Basis
%Ash	66.98
%Combustible	33.02
%Sulfur	0.25

Respectfully submitted,
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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Economizer Hopper Ash	Test#17 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	1/10/79	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28264

	Dry Basis
%Ash	48.32
%Combustible	51.68
%Sulfur	0.65

Respectfully submitted,
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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Bottom Ash	Test#20 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	1/19/79	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28266

	Dry Basis
%Ash.....	91.93
%Combustible.....	8.07

Respectfully submitted,
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KVB, INC.
A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Dust Collector Ash	Test#20 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	1/19/79	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28267

	Dry Basis
%Ash.....	51.51
%Combustible.....	48.49

Respectfully submitted,
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A Research-Cottrell Company
6176 Olson Memorial Highway
Minneapolis, Minnesota 55422
Attn: J. Burlingame

March 2, 1979

Sample identification by KVB, INC.

Kind of sample reported to us	Economizer Ash	Test#20 Test Site: E
Sample taken at	-----	
Sample taken by	KVB, Inc.	
Date sampled	1/19/79	
Date received	2/23/79	P/O# 323-15900

Analysis report no. 71- 28268

	Dry Basis
%Ash.....	53.76
%Combustible.....	46.24

Respectfully submitted,
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COMBUSTIBLES DATA SHEET

SITE E

Crucible Number	Sample Origin	Crucible Weight grams	Crucible & Sample Weight Post 110°C gms	Sample Weight grams	Post 750°C grams	Δ Weight grams	% Combustibles
43	TEST #6 BLR OUT	9.8499	10.6735	0.8234	10.1601	0.5134	62.3
		9.8502	10.6736		10.1601		
		9.8503	—		—		
	AVG.	9.8501	10.6735		10.1601		
39	TEST #7 BLR OUT	10.0003	10.6715	0.6712	10.1663	0.5054	75.3
		10.0005	10.6718		10.1662		
		10.0005	—				
	AVG.	10.0004	10.6716		10.1662		
35	TEST #8 BLR OUT	9.8310	10.5801	0.9714	10.1162	0.6863	70.6
		9.8311	10.5804		10.1162		
		9.8313	—		—		
	AVG.	9.8311	10.8025		10.1162		
42	TEST #9 BLR OUT	10.3687	11.3745	1.0059	10.7429	0.6317	62.8
		10.3690	11.3750		10.7431		
		10.3689	—		—		
	AVG.	10.3688	11.3747		10.7430		
34	TEST #11 BLR OUT	10.1717	11.2102	1.0385	10.6010	0.6093	58.6
		10.1719	11.2105		10.6011		
		10.1718	—		—		
	AVG.	10.1718	11.2103		10.6010		
38	TEST #12 BLR OUT	10.1474	11.5897	1.4424	10.8758	0.7141	49.5
		10.1475	11.5901		10.8758		
		10.1477	—		—		
	AVG.	10.1475	11.5899		10.8758		
36	TEST #13 BLR OUT	9.4581	10.3062	0.8480	9.8087	0.4977	58.6
		9.4584	10.3068		9.8089		
		9.4577	—		—		
	AVG.	9.4581	10.3065		9.8088		
20	TEST #14 BLR OUT	8.8413	9.7429	0.9015	8.9902	0.7528	83.5
		8.8416	9.7430		8.9900		
		8.8414	—		—		
	AVG.	8.8414	9.7429		8.9901		
21	TEST #15 BLR OUT	9.4794	10.5612	1.0816	9.9083	0.6530	60.3
		9.4797	10.5612		9.9082		
		9.4797	—		—		
	AVG.	9.4796	10.5612		9.9082		
22	TEST #20 BLR OUT	9.7279	10.6226	0.8946	9.9264	0.6964	77.8
		9.7282	10.6228		9.9262		
		9.7283	—		—		
	AVG.	9.7281	10.6227		9.9263		
	AVG.						

COMBUSTIBLES DATA SHEET

SITE E

Crucible Number	Sample Origin	Crucible Weight grams	Crucible & Sample Weight Post 110°C gms	Sample Weight grams	Post 750°C grams	Δ Weight grams	% Combustibles
2	TEST #3 MECH Site E	3.9727	3.9977	0.0250	3.9906	0.0072	28.8
		3.9728	3.9977		3.9905		
		3.9727	3.9978		3.9905		
	AVG.	3.9727	3.9977		3.9905		
4	TEST #6 MECH Site E	3.7108	4.5321	0.8213	4.0288	0.5034	61.2
		3.7110	4.5321		4.0286		
		3.7106	4.5322		4.0286		
	AVG.	3.7108	4.5321		4.0287		
6	TEST #7 MECH Site E	3.7397	4.7889	1.0493	4.0837	0.7056	67.2
		3.7399	4.7891		4.0835		
		3.7397	4.7892		4.0836		
	AVG.	3.7398	4.7891		4.0836		
3	TEST #4 MECH Site E	3.6688	3.6997	0.0309	3.6936	0.0062	20.0
		3.6686	3.6996		3.6934		
		3.6686	3.6996		3.6933		
	AVG.	3.6687	3.6996		3.6934		
7	TEST #9 MECH Site E	3.7836	3.9512	0.1677	3.8481	0.1030	61.4
		3.7832	3.9511		3.8481		
		3.7835	3.9511		3.8480		
	AVG.	3.7834	3.9511		3.8481		
8	TEST #11 MECH Site E	3.8303	4.8495	1.0194	4.2171	0.6325	62.0
		3.8303	4.8498		4.2172		
		3.8302	4.8497		4.2173		
	AVG.	3.8303	4.8497		4.2172		
11	TEST #12 MECH Site E	3.7116	4.6360	0.9247	4.1181	0.5181	56.0
		3.7116	4.6365		4.1182		
		3.7115	4.6364		4.1182		
	AVG.	3.7116	4.6363		4.1182		
12	TEST #13 MECH Site E	3.9451	4.6418	0.6969	4.2451	0.3971	56.9
		3.9451	4.6420		4.2447		
		3.9450	4.6421		4.2448		
	AVG.	3.9451	4.6420		4.2449		
	AVG.						
	AVG.						
	AVG.						

KVB

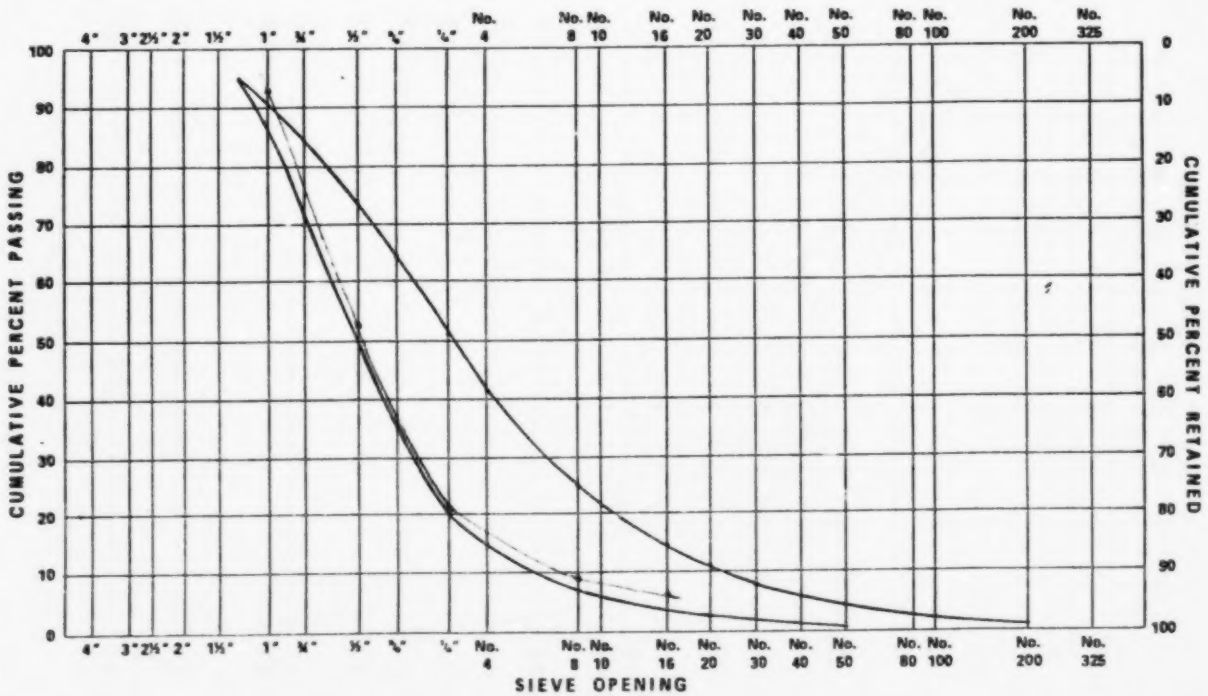
SIEVE ANALYSIS TEST REPORT

TEST NO. 2 DATE SAMPLE TAKEN 11-16

TEST SITE 6 TEST PERFORMED BY JRB

SAMPLE IDENTIFICATION Kent Conc - Fractured Rock

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.3	426.5 376.7	584.4	6.8	8615.5	100.0	3
1"		13448 13967 1140.3	3558.9	41.3	8031.1	93.2	3
1/2"		1252.3 1147.6 625.3	2697.3	31.3	4472.2	51.9	3
1/4"		1114.4	1010.1	11.7	1774.9	20.6	3
#8		458.4	349.1	4.1	764.8	8.9	3
#16	V	525.0	415.7	4.8	415.7	4.8	3


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
100 90 80 70 60 50 40 30 20 10 0
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 5

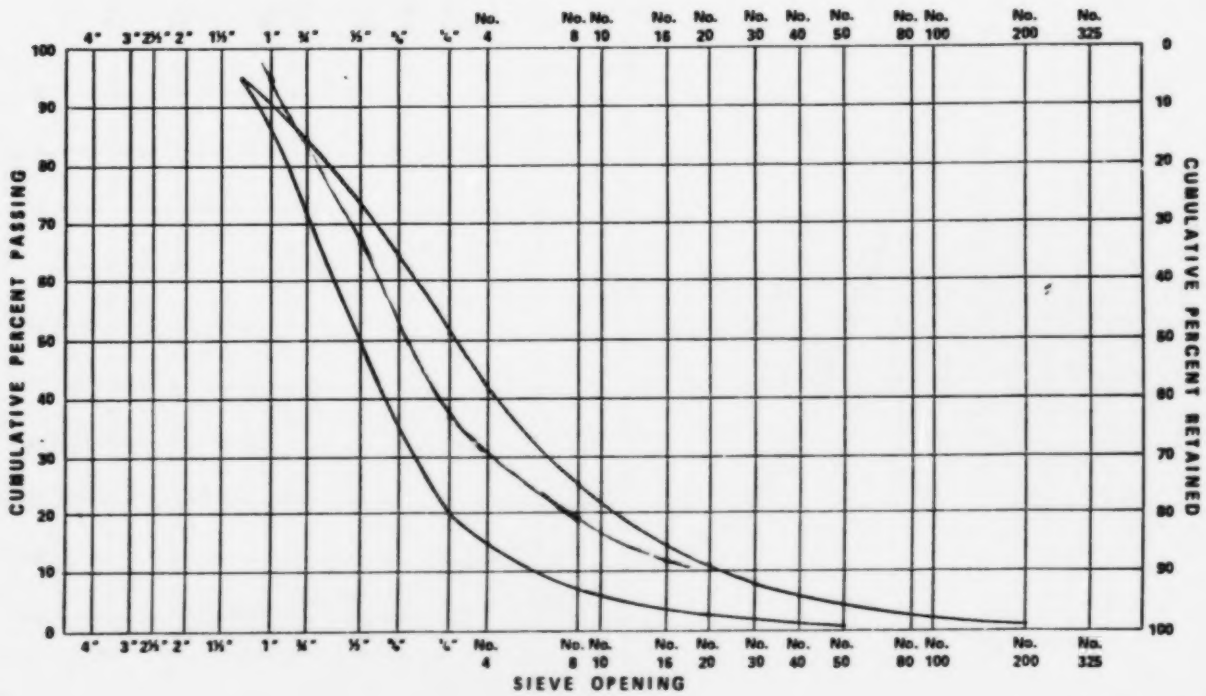
DATE SAMPLE TAKEN 11-18-78

TEST SITE E

TEST PERFORMED BY JB

SAMPLE IDENTIFICATION Kentucky Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	1087	3460 2236	372.2	4.4	8436.9	100.0	3
1"		1529.8 11745	2486.9	29.5	8064.7	95.6	3
½"		1237.6 1440.1	2460.3	29.2	5577.8	66.1	3
¼"		6561 10604	1499.1	17.8	3117.5	36.9	3
#8		7413	633.1	7.5	1618.4	19.1	3
#16		10940	985.3	11.7	985.3	11.6	3


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 4

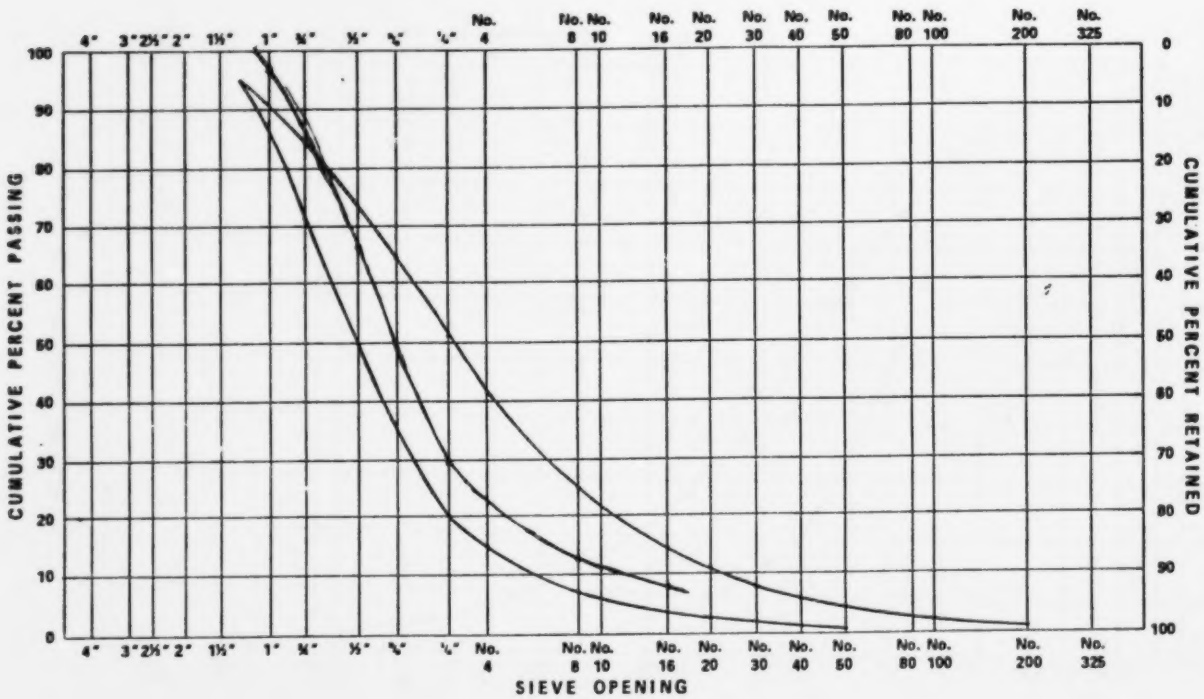
TEST SITE E

SAMPLE IDENTIFICATION Knit Coal

DATE SAMPLE TAKEN 11-20-78

TEST PERFORMED BY JCB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	1091	3197 1820	2103	2.2	65663	100.0	3
1"		1392 731.2	2031.0	30.9	63560	96.8	3
1/2"		1142.0 1470.3	2342.9	36.4	43250	65.9	3
1/4"		4574 864.0	1102.0	16.8	19321	29.5	3
#8		4493	339.6	5.2	8201	12.7	3
#16		6002	490.5	7.5	4905	7.5	3


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
100 90 80 70 60 50 40 30 20 10 0
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 5

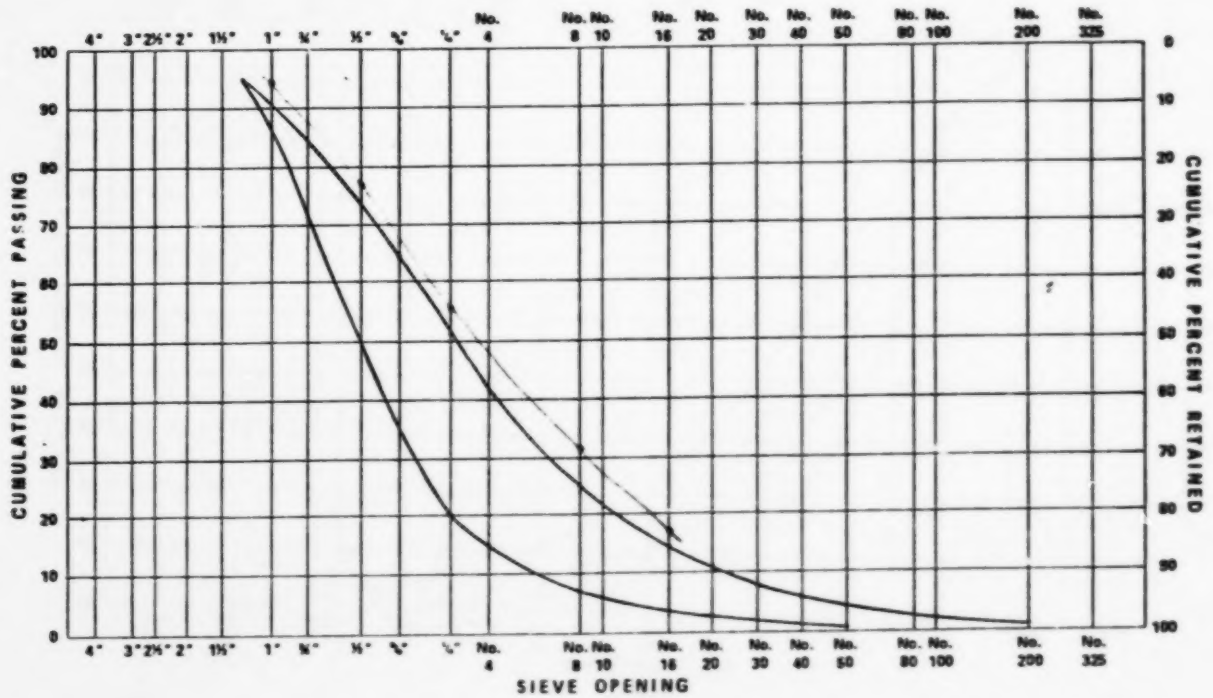
TEST SITE E

SAMPLE IDENTIFICATION Kentucky Coal

DATE SAMPLE TAKEN 11-21-78

TEST PERFORMED BY JVB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.0	1913.8 4245	3803	49	7805.9	100.0	3
1"		1355.2 1000.5	1445.7	18.1	7425.6	95.1	3
½"		909.7 1058.5	1748.2	22.4	6004.9	77.0	3
¼"		1091.2 420.2	1791.4	22.9	4261.7	54.6	3
#8		1238.3	1128.3	14.5	2470.3	31.7	3
#16		1452.0	1342.0	17.2	1342.0	17.2	3


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

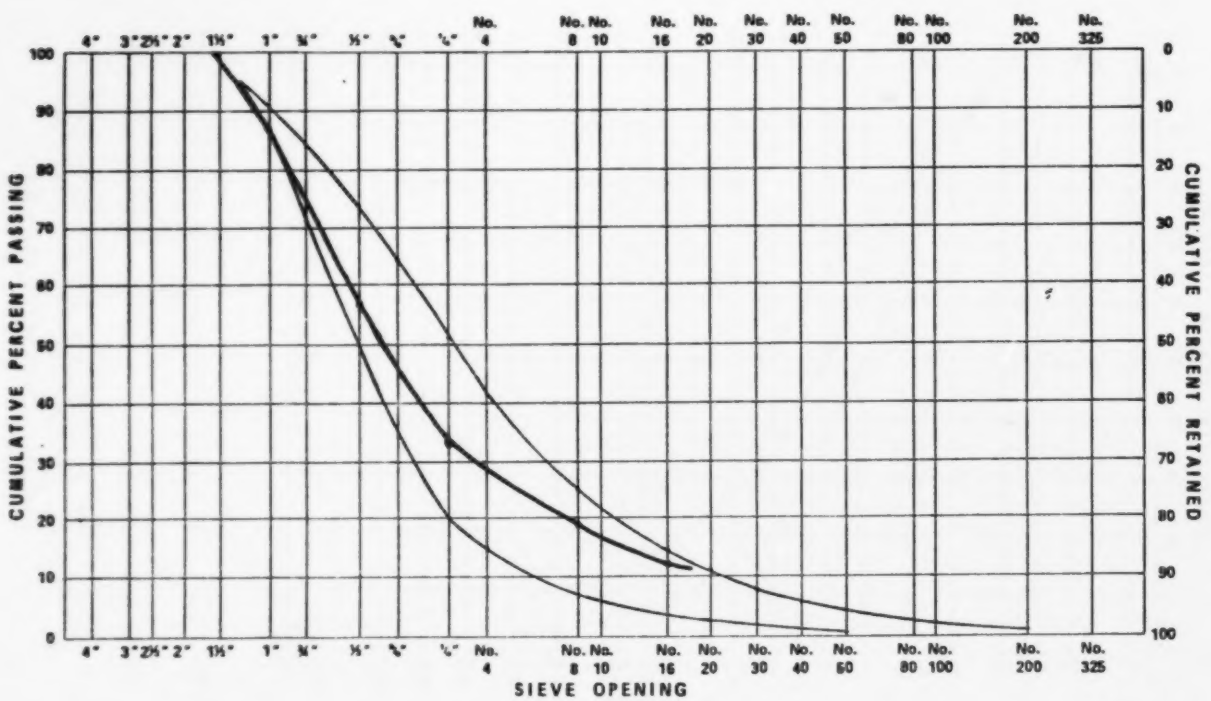
SIEVE ANALYSIS TEST REPORT

TEST NO. 6 DATE SAMPLE TAKEN 12-12-78

TEST SITE E TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION Kentucky - Industrial

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.8	617.4 521.5	919 3	13 4	6865.1	100 0	3
1"		1314.3 959.3	2054.0	29 9	59458	866	3
1/2"		825.5 961.5	15724	22 9	3891.8	56 7	3
1/4"		1121.2	10114	14 7	23194	33 8	3
#8		1146.0	436.2	6 4	13084	19.1	3
#16		1843 907.1	871 8	12 7	871 8	12 7	3


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 7

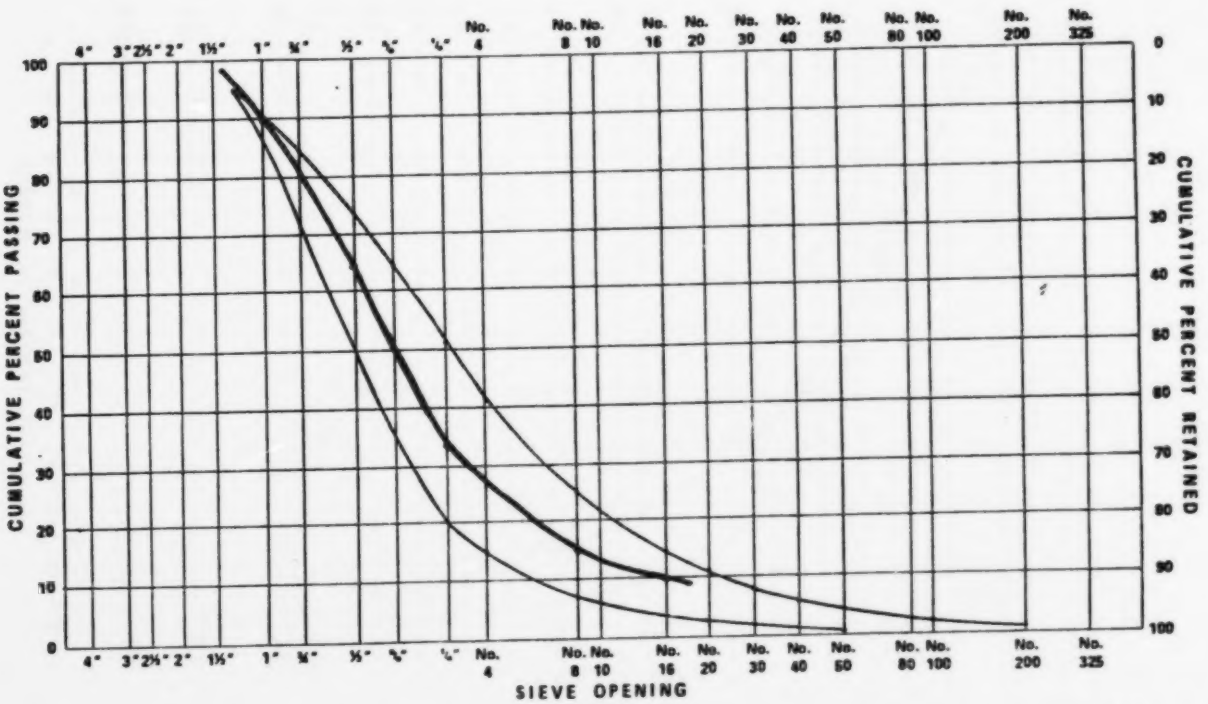
TEST SITE E

SAMPLE IDENTIFICATION Kentucky Coal

DATE SAMPLE TAKEN 12-14-78

TEST PERFORMED BY JOB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	109.5	436.5 650.1	867.6	10.6	8206.4	100.0	3
1"	↓	1012.4 1206.0	1999.4	24.4	7338.8	89.5	3
½"		1373.8 1402.5	2557.3	31.2	5339.4	65.1	3
¼"		907.8 840.6	1529.4	18.6	2782.1	33.9	3
#8		560.0	450.5	5.5	1252.7	15.3	3
#16	↓	911.7	802.2	9.8	801.2	9.8	3


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 8

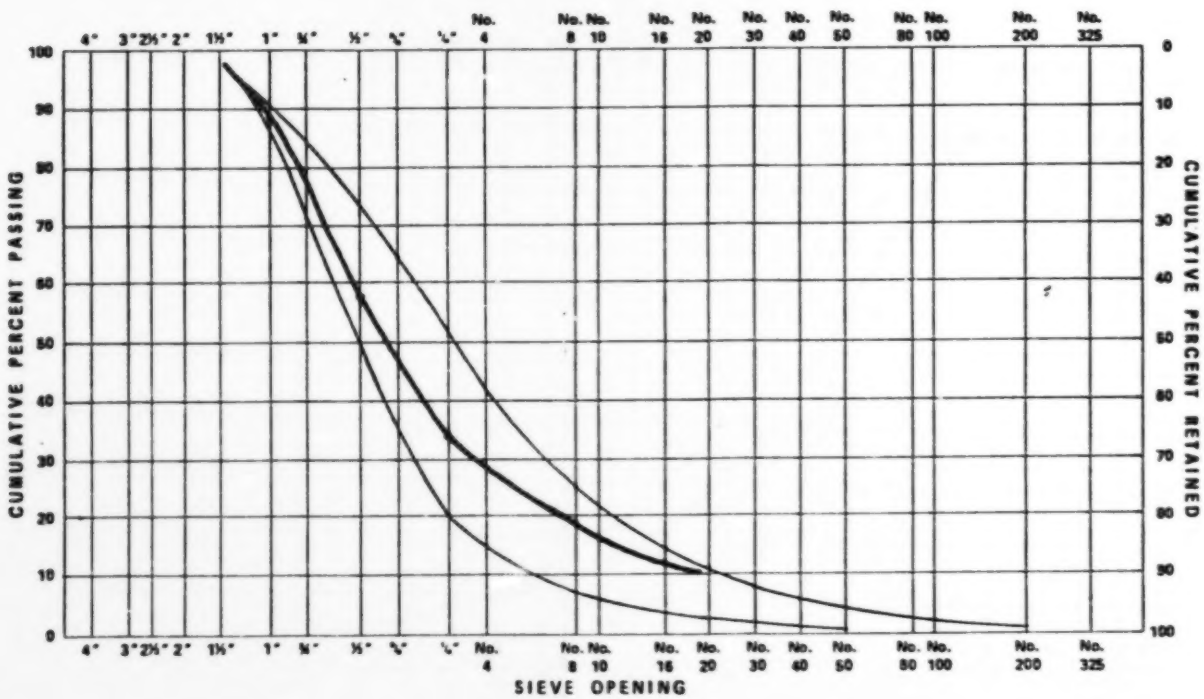
TEST SITE E

SAMPLE IDENTIFICATION Kent Industrial

DATE SAMPLE TAKEN 12-15-78

TEST PERFORMED BY JOB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	104.5	5830 7549	9229	12.1	7601.6	100.0	3
1"		12805 12644	2345.7	30.9	6678.7	87.9	3
1/2"		9731.7 10136	1726.3	22.7	4333.0	57.0	3
1/4"		7001 7227	1208.8	15.9	2606.7	34.3	3
#8		5832	473.7	6.2	1397.9	18.4	3
#16		1033.7	924.2	12.2	924.2	12.2	3


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 9

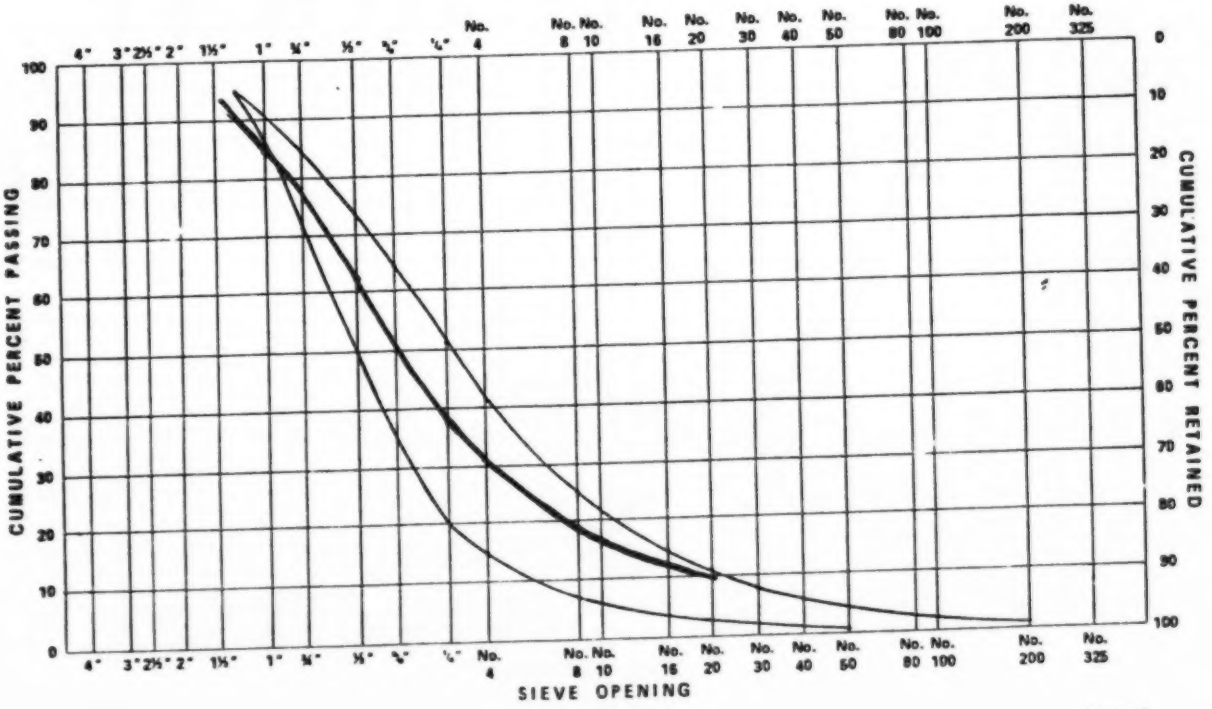
DATE SAMPLE TAKEN 12-16-78

TEST SITE E

TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION KENTUCKY COAL (INDUSTRIAL)

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	1095	6360 8328	12498	14.7	8511.4	100.0	3
1"		9412 1262.1	19843	23.3	7261.6	85.3	3
½"		9999 1310.9	2091.8	24.6	5277.3	62.0	3
¼"		753.7 1014.1	15486	18.2	3185.5	37.4	3
#8		701.1	591.6	7.0	1636.7	19.2	3
#16		1154.6	1045.1	12.3	1045.1	12.2	3


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

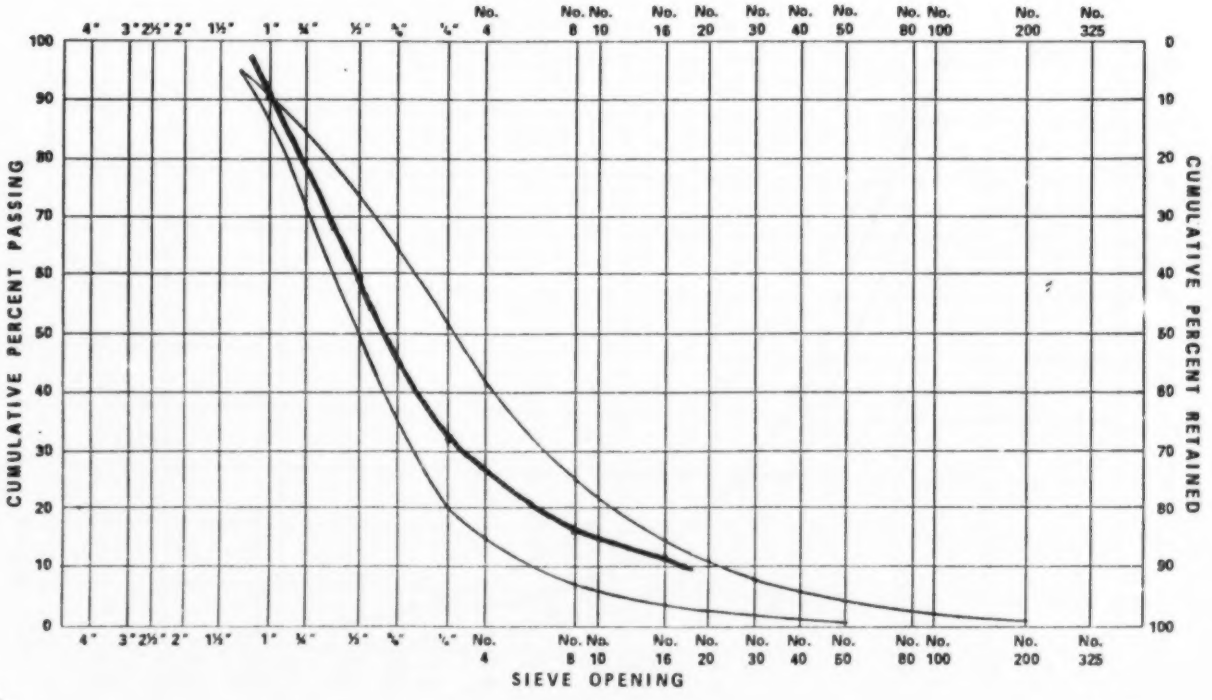
SIEVE ANALYSIS TEST REPORT

TEST NO. 11 DATE SAMPLE TAKEN 12-18-78

TEST SITE E TEST PERFORMED BY JCB

SAMPLE IDENTIFICATION Kent-Industrial

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	190.5	5654 5118	8682	96	8922.0	100.0	3
1"		13731 1648.9	2803.0	31.4	8063.8	90.4	3
½"		1219.4 1465.4	2465.8	27.6	5260.8	59.0	3
¼"		710.3 885.9	1377.2	15.4	2795.0	31.4	3
#8		5775	468.0	5.3	1417.8	16.0	3
#16		10593	949.8	10.6	949.8	10.7	3


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
100 90 80 70 60 50 40 30 20 10 0
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

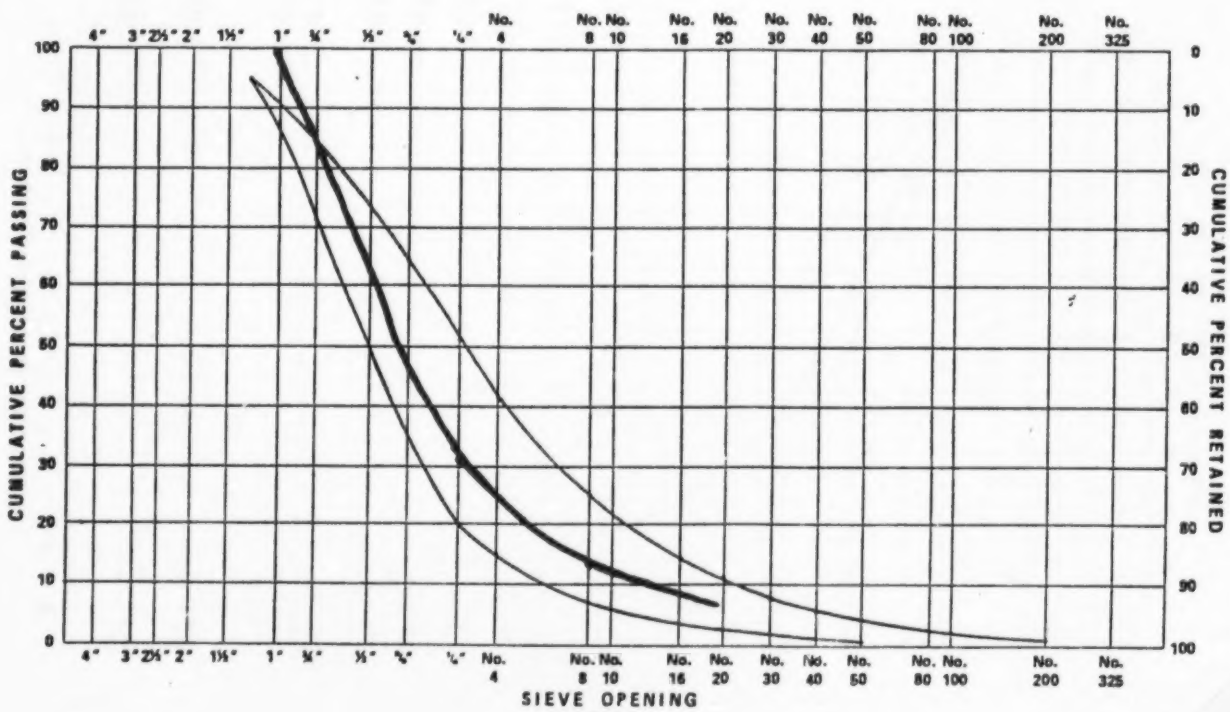
SIEVE ANALYSIS TEST REPORT

TEST NO. 12 DATE SAMPLE TAKEN 12-20-76

TEST SITE E TEST PERFORMED BY 403

SAMPLE IDENTIFICATION Crushed Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.5	1807 1817.6	1493	23	6567.9	100.0	3
1"		1237.4 1369.7	2388.1	36.4	6418.6	97.8	3
1/2"		1206.0 1047.4	2014	31.0	4030.5	61.4	3
1/4"		729.7 589.1	1099.8	16.7	1996.1	30.4	3
#8		449.8	340.3	5.2	896.3	13.7	3
#16	↓	665.5	556.0	8.5	556.0	8.5	3


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
100 90 80 70 60 50 40 30 20 10 0
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

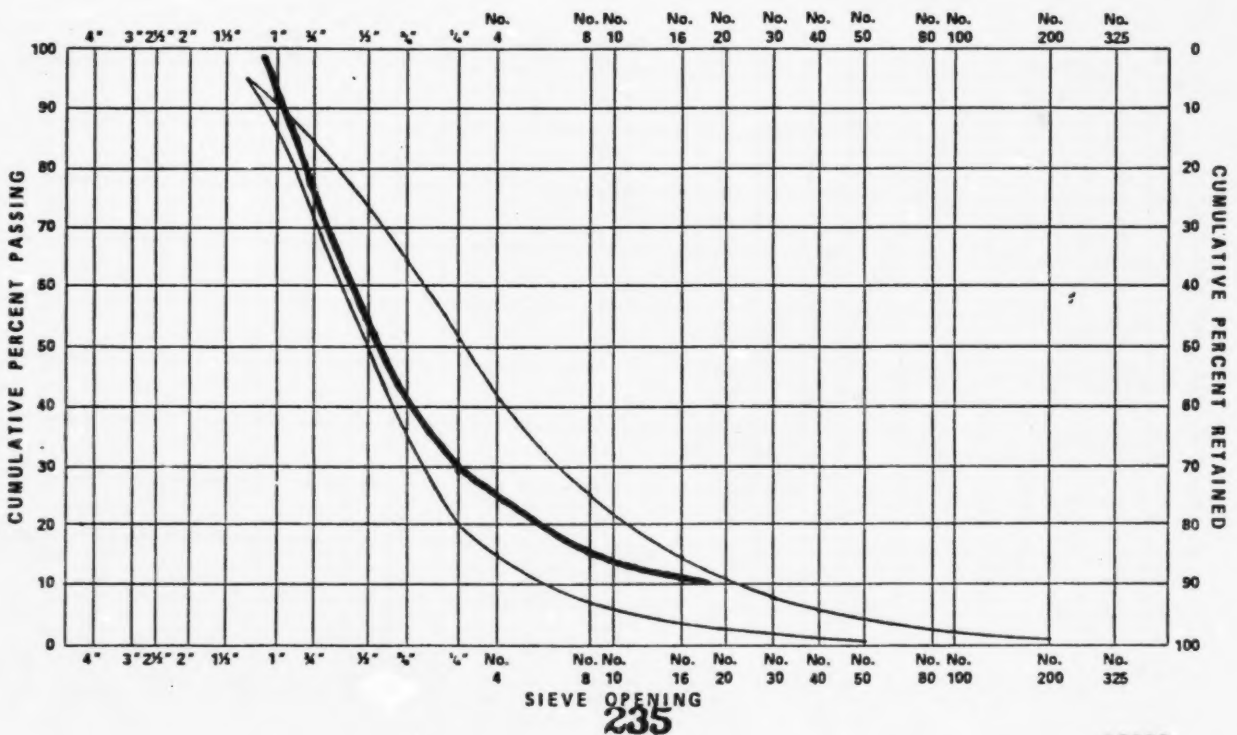
SIEVE ANALYSIS TEST REPORT

TEST NO. 13 DATE SAMPLE TAKEN 12-20-74

TEST SITE E TEST PERFORMED BY KVB

SAMPLE IDENTIFICATION Crushed Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	1095	2519 5161	5447.0	85	64515	100.0	3
1"		12107 14562	2347.9	37.2	59025	91.5	3
½"		10192 8348	1635.0	25.3	35046	54.3	3
¼"		6649 9422	888.1	13.8	1869.6	29.0	3
#8		9270	375	4.9	981.5	15.2	3
#16	V	7735	664.0	10.3	664.0	10.3	3


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
100 90 80 70 60 50 40 30 20 10 0
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. 14

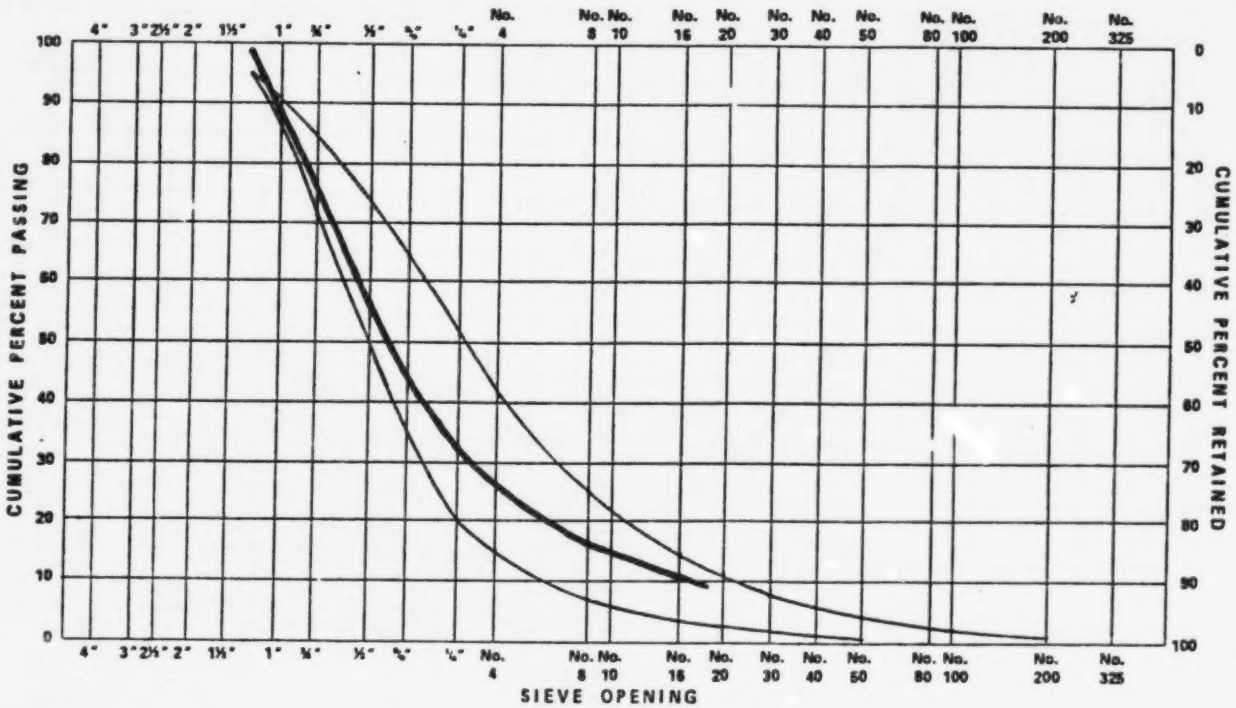
TEST SITE E

SAMPLE IDENTIFICATION Crushed Coal

DATE SAMPLE TAKEN 12-20-78

TEST PERFORMED BY JOB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	1095	4464 7983	10757	11.5	9386.9	100.0	3
1"		14144 18571	30485	32.5	8311.2	88.5	3
½"		12739 11427	21976	23.4	52627	56.0	3
¼"		10726 6925	15361	16.4	3065.1	32.6	3
#8		6611	5516	5.9	1529.0	16.2	3
#16	↓	10869	9774	10.4	9774	10.3	3


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
100 90 80 70 60 50 40 30 20 10 0
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. K

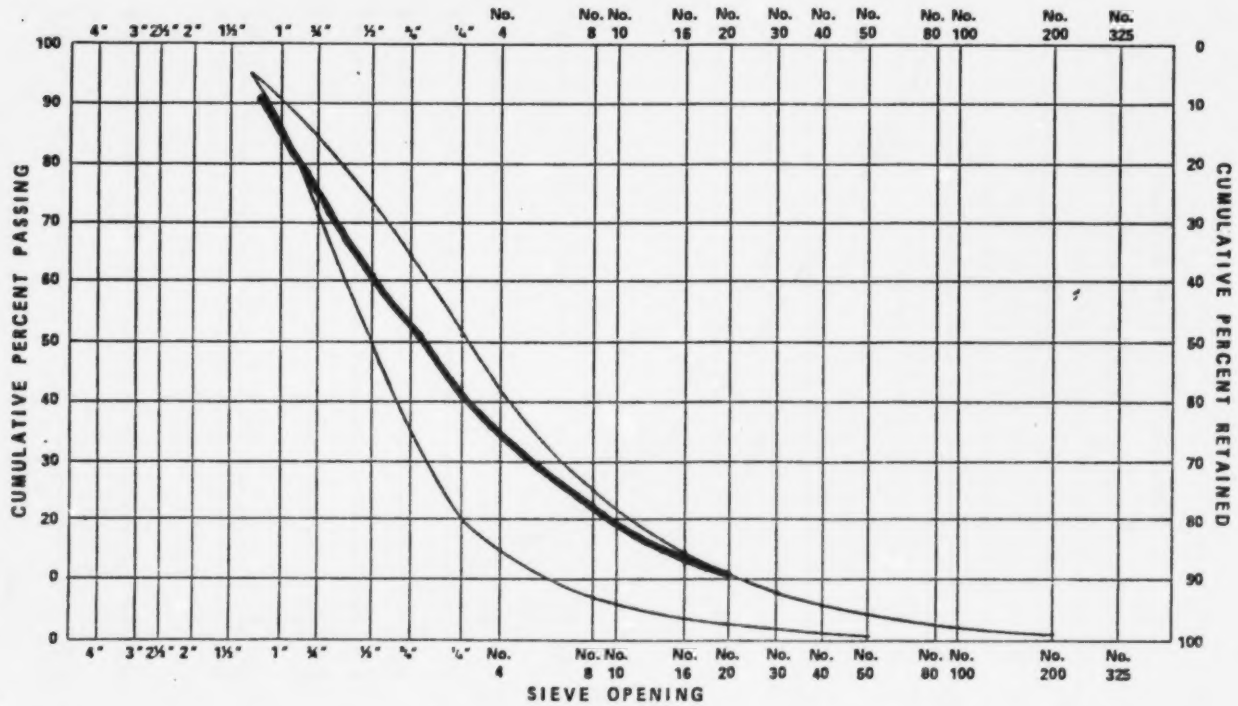
TEST SITE E

SAMPLE IDENTIFICATION Eastern Kentucky Coal

DATE SAMPLE TAKEN 1-5-79

TEST PERFORMED BY JOB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.2	480.2 800.6	1060.4	14.3	7415.4	100.0	4
1"		666.9 1400.2	1846.7	24.9	6355.0	85.7	4
1/2"		757.5 964.5	1501.6	20.2	4508.3	60.8	4
4		715.5 903.6	1398.7	18.9	3006.7	40.6	4
#8		721.8	611.6	8.2	1608.0	21.7	4
#16		1106.6	996.4	13.4	996.4	13.5	4


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
100 90 80 70 60 50 40 30 20 0
CUMULATIVE PERCENT PASSING
0 10 20 30 40 50 60 70 80 90 100
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

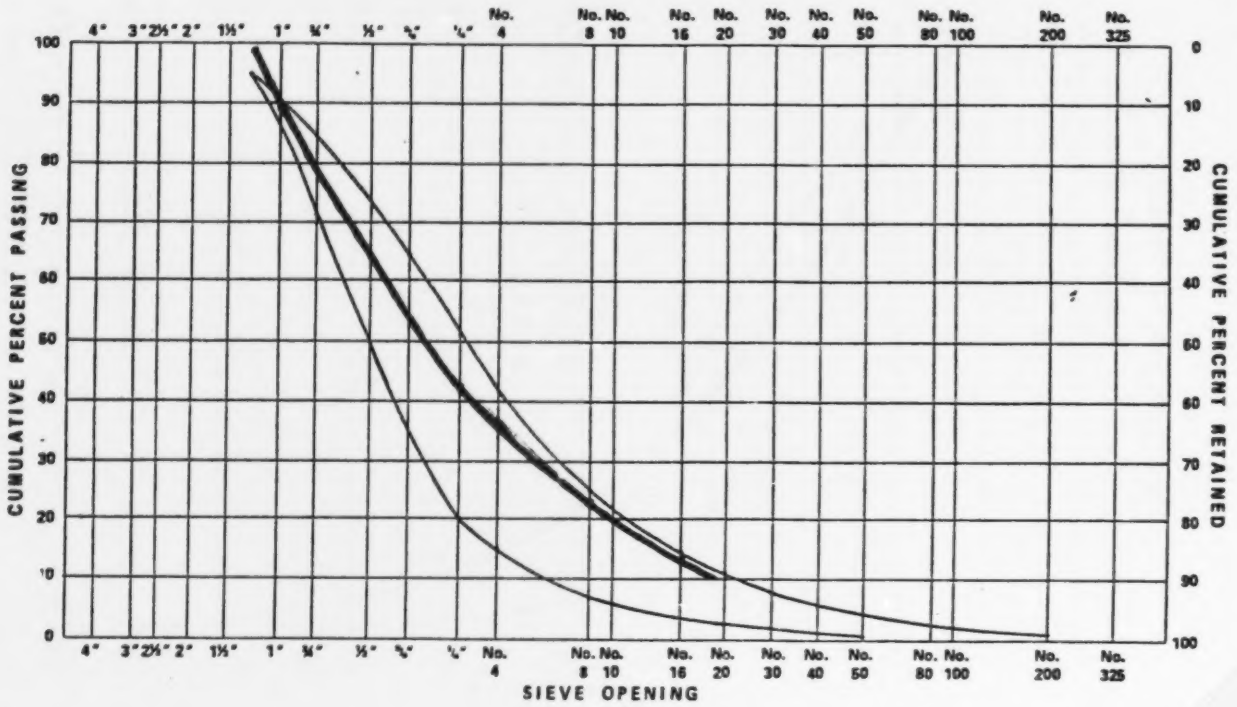
SIEVE ANALYSIS TEST REPORT

TEST NO. 16 DATE SAMPLE TAKEN 1-8-79

TEST SITE E TEST PERFORMED BY JOB

SAMPLE IDENTIFICATION Eastern Kentucky Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
TOP	110.9	4606 4478	9366	10.5	8891.7	100.0	4
1"		12605 12269	22654	25.5	7955.1	89.4	4
½"		13146 894.1	1991.9	22.4	5689.7	63.9	4
¼"		9107 9766	1665.3	18.7	3697.8	41.5	4
#8		9390	8281	9.3	20325	228	4
#16		13153	12044	13.5	12044	135	4


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
100 90 80 70 60 50 40 30 20 10 0
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

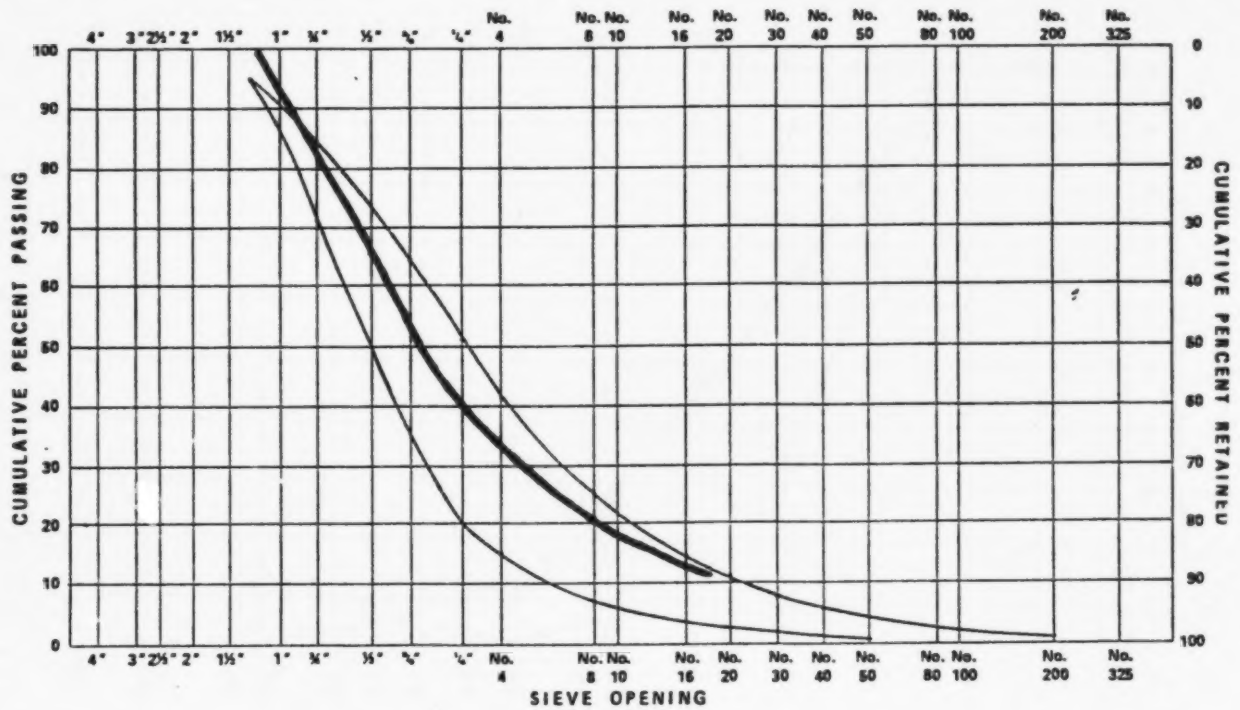
SIEVE ANALYSIS TEST REPORT

TEST NO. 17 DATE SAMPLE TAKEN 1-10-79

TEST SITE E TEST PERFORMED BY JES

SAMPLE IDENTIFICATION Kentucky Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	109.3	6074	4981	7.0	70310	100.0	4
1"		10226 10954	18994	26.9	65729	93.0	4
½"		10015 10489 8185	18318	25.9	46735	66.1	4
¼"		7849	13848	19.6	28417	40.2	4
#8		6919	5826	8.2	14569	20.6	4
#16	↓	9836	8743	12.4	8743	12.4	4


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

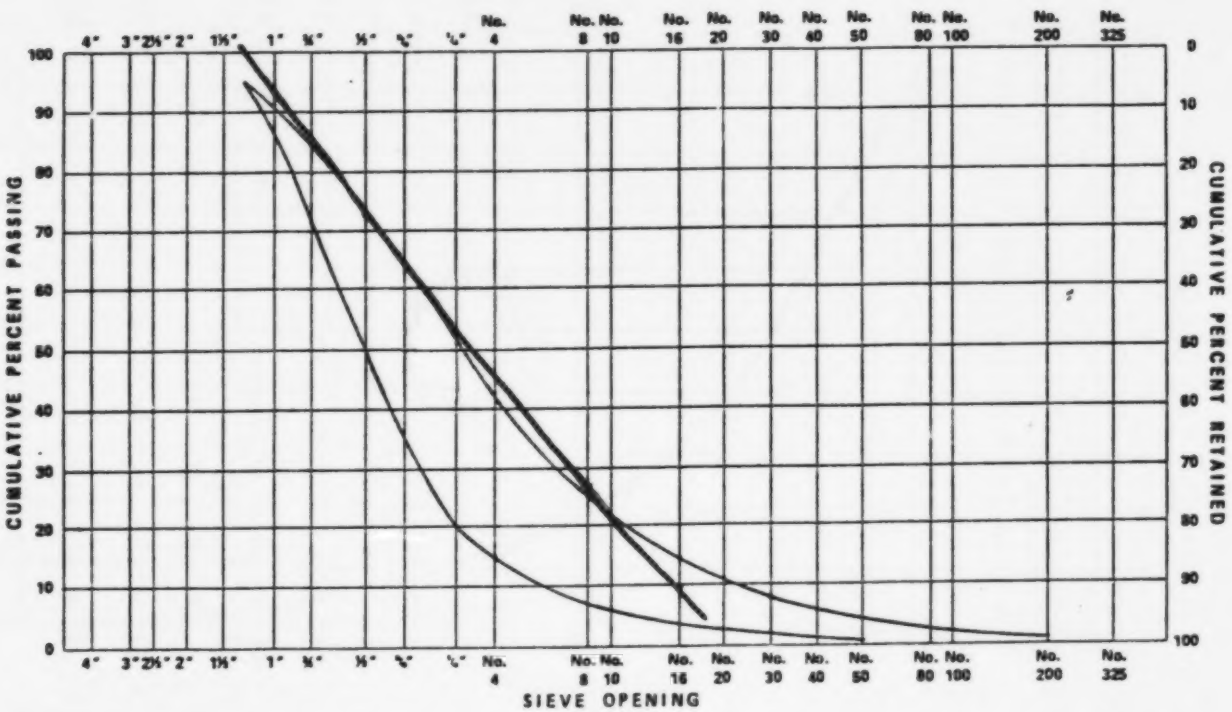
SIEVE ANALYSIS TEST REPORT

TEST NO. 20 DATE SAMPLE TAKEN 1-K-77

TEST SITE E TEST PERFORMED BY JB

SAMPLE IDENTIFICATION Kut

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	110.7	410.8 3222	5116	66	77795	100.0	4
1"		8883 8783	1544.9	19.9	7267.9	93.4	4
½"		1062.6 8278	16690	215	5723.0	73.5	4
¼"		1257.7 776.7 3242	20045	25.6	40540	52.0	4
#8		763.7 7427	1285.0	16.5	20495	26.2	4
#16	↓	875.2	764.5	9.8	7645	9.7	4


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. Composite

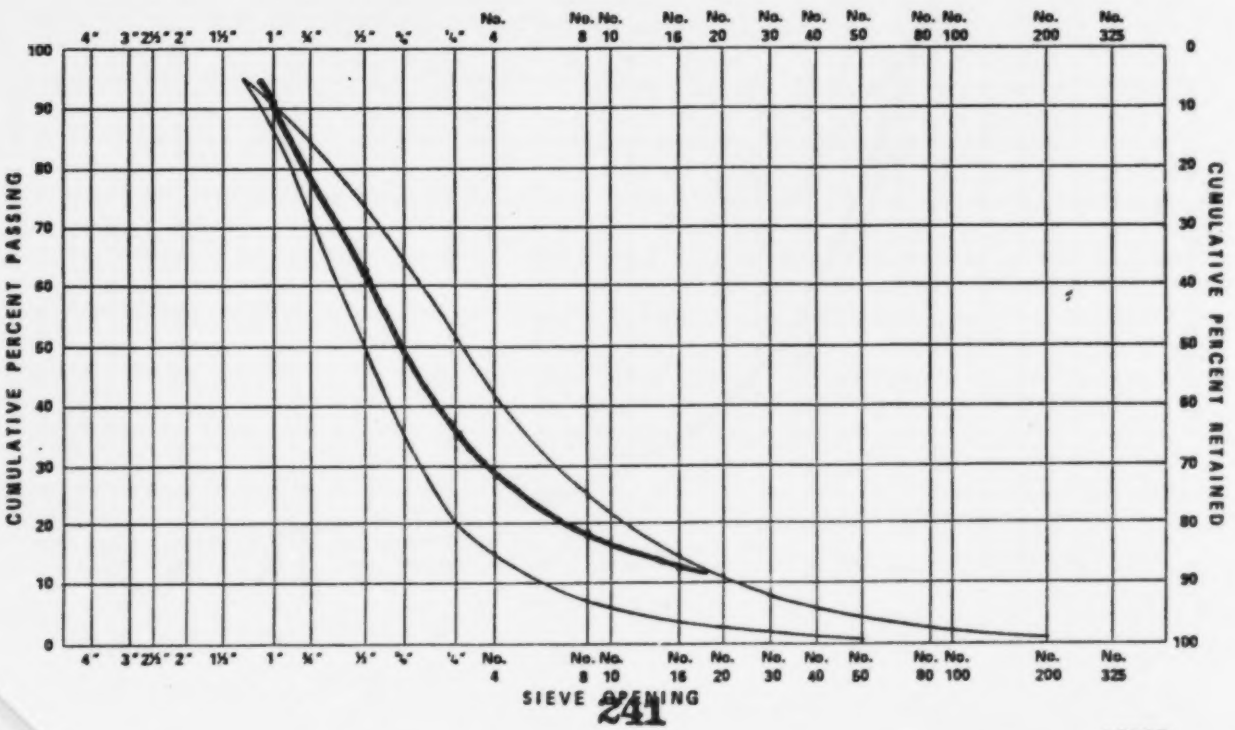
TEST SITE E

SAMPLE IDENTIFICATION Kent

DATE SAMPLE TAKEN Composite

TEST PERFORMED BY JOE

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	118.7	385.6 647.0	811.2	9.4	8602.9	100.0	4
1"		608.6 978.5 1233.0	2488.0	28.9	7791.7	90.6	4
½"		1049.6 1448.8	2277.0	26.5	5303.7	61.7	4
¼"		685.6 971.5	1435.7	16.7	3026.7	35.2	4
#8		641.0	530.3	6.2	1591.0	18.5	4
#16		380.8 901.7	1060.7	12.3	1060.7	12.3	4


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
100 90 80 70 60 50 40 30 20 10 0
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. Composite

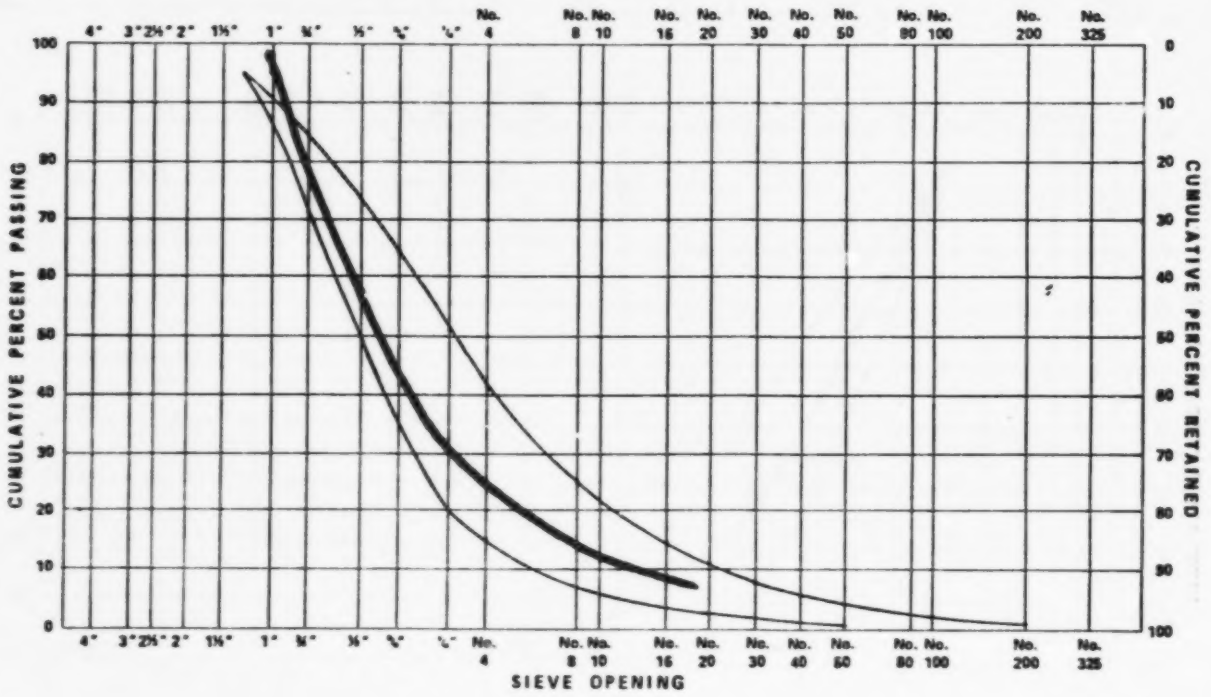
DATE SAMPLE TAKEN 12-20-13

TEST SITE E

TEST PERFORMED BY JLB

SAMPLE IDENTIFICATION Crushed Coal

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	1045	2069 5226	3105	4.3	72922	100 0	3
1"		12376 17985	28171	38.6	69817	957	3
¾"		10217 11542	1956.9	26.8	4164.6	57.1	3
½"		8097 5852	1175.9	16.1	22077	30 3	3
#8		5236	414.1	5.7	10318	142	3
#16		727.2	617.7	8.5	617	85	3


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
100 90 80 70 60 50 40 30 20 10 0
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

15900

KVB

SIEVE ANALYSIS TEST REPORT

TEST NO. Composite

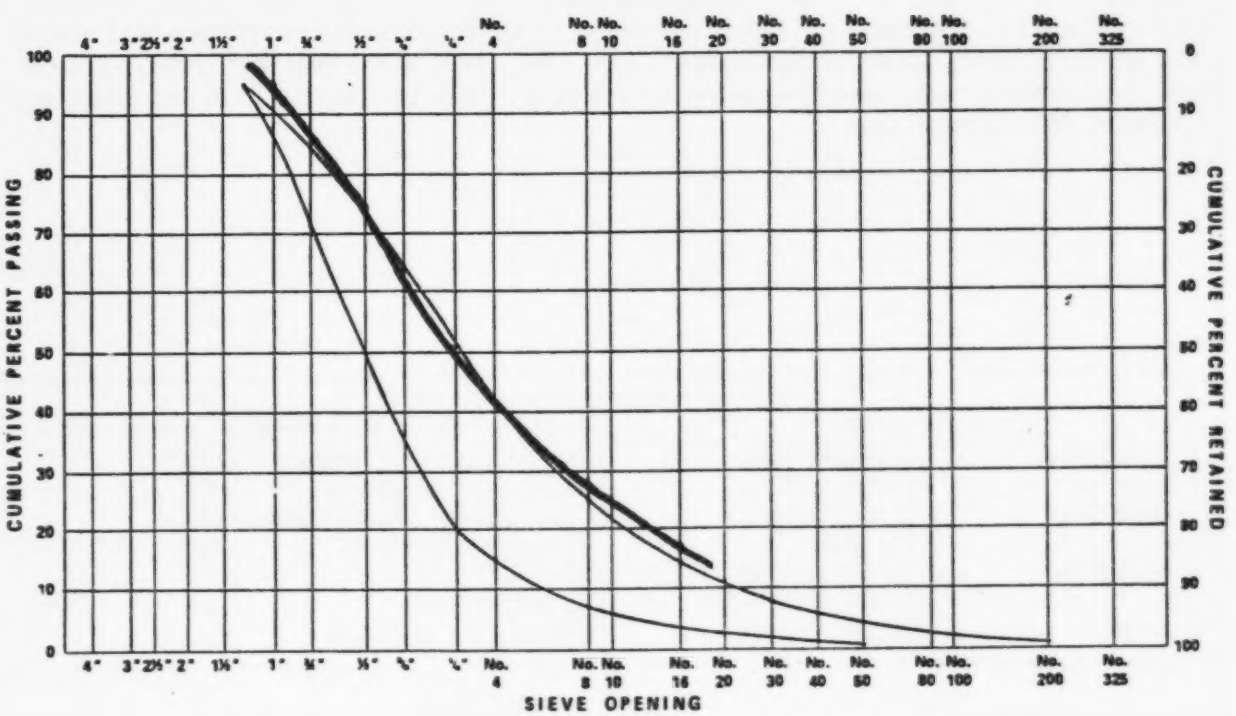
TEST SITE E

SAMPLE IDENTIFICATION Eastern Kentucky

DATE SAMPLE TAKEN 1-8-79

TEST PERFORMED BY JOB

Screen Size Passing	Tare Weight (gm)	Gross Weight (gm)	Net Weight (gm)	Percent (%)	Cumulative Weight Passing (gm)	Cumulative Percent Passing (%)	Sieve Shaker Duration (min)
Top	89.1	362.3	273.2	5.1	53388	100.0	4
1"		470.5 835.8	1128.1	21.1	50656	94.9	4
1/2"		774.4 735.0	1296.2	24.3	39375	73.8	4
1/4"		6490 7833	1179.1	22.0	26413	49.5	4
#8		6595	570.4	10.7	14672	27.5	4
#16	↓	4777 5613	896.8	16.8	8968	16.8	4


4" 3" 2½" 2" 1½" 1" ¾" ½" ⅜" ¼" No. 4 No. 8 No. 10 No. 16 No. 20 No. 30 No. 40 No. 50 No. 80 No. 100 No. 200 No. 325
100 90 80 70 60 50 40 30 20 10 0
CUMULATIVE PERCENT PASSING
CUMULATIVE PERCENT RETAINED
SIEVE OPENING

243

15900